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DATA ANALYSIS AS THE DECIDING FACTOR

New Fair Isaac framework designed to help businesses make better decisions

BY DAVID RUBINSTEIN

Decisions, decisions.

Businesses need to automate their decisions to raise productivity, according to Fair Isaac Inc., which later this month will release updates to its Blaze Advisor rules engine and to Model Builder as part of an overall strategy it is calling Enterprise Decision Management (EDM).

Fair Isaac is creating an EDM framework that takes in business rule and model components and decision process designs for the creation and execution of long-running decision services or applications, according to James Taylor, the company's director of product management for decision management software and solutions.

"It's getting harder for businesses to make decisions due to the complexity surrounding those decisions," Taylor said. "They need to get more sophisticated for rating and pricing for a fine-grained segmentation of their customer base."

The ability to do this comes

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Sun, Microsoft Beat Swords Into IP Sharing

Cross-licensing deal comes together in wake of Sun's poor earnings report

BY YVONNE L. LEE

Interoperability may be in the spring air as a result of the unexpected thawing of long-standing tensions between Sun Microsystems Inc. and Microsoft Corp., according to analysts.

In a love fest that began with the two companies' CEOs exchanging autographed jerseys from their hometown Detroit Red Wings, the tech giants in early April announced a 10-year cooperation pact that includes a one-time payment from Microsoft of US$1.9 billion to Sun.

Microsoft's Ballmer: We're rebuilding trust.

"Microsoft finally bowed to the pressure of its customer base who said, 'Cut it out and get this stuff to work together,'" said Rikki Kirzner, research director for application development and deployment at IDC.

"We needed to rebuild between the companies a level of trust," Microsoft CEO Steve Ballmer said at a press conference in San Francisco.

The treaty puts the two companies in a position to better compete against a common enemy, IBM Corp., said Clay Ryder, executive vice president of analyst firm The Sageza Group.

Under the wide-ranging agreement, Microsoft will pay Sun $700 million to settle pending antitrust issues and $900 million to resolve patent issues. In addition, both companies have agreed to pay royalties to use each other's technology, with Mi-

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Micro Focus: Getting CICS From Windows

BY EDWARD J. CORREIA

Micro Focus International Ltd. has announced Linux and Unix editions of Mainframe Transaction Option, an add-on to its Enterprise Server COBOL runtime environment that it claims provides a stable *x*86-based platform to which CICS/COBOL transactional applications can migrate. The company in April released an edition for Windows servers.

A browser-based utility lets Mainframe Transaction Option users monitor CICS performance.

"This is a low-risk route to lower hardware and software costs for mainframe users," said Ian Archbell, vice president of product management at Micro Focus. "For applications running at under 500 MIPS [million instructions per second], the solution is more than adequate," he claimed, asserting further that the solution should be an ample migration path for mainframes now running at less than 1,000 MIPS. "We get the same performance as a mainframe because our native code generators are optimized for the platform." Archbell provided only anecdotal evidence to back up his claims, adding that in-house benchmark performance tests are still under way.

Archbell said the scope of CICS-based systems goes far beyond financial institutions,

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'LONGHORN' BETA DELAYED UNTIL 2005

BY JENNIFER DEJONG

Microsoft Corp.'s successor to Windows XP, code-named "Longhorn," will not be ready to go into beta until early next year, the company said last month.

News of the Longhorn delay followed the company's March 10 announcement that SQL Server 2005 (formerly "Yukon") and Visual Studio 2005 (formerly "Whidbey") will not be released until the first half of 2005. All three were previously promised for late 2004.

Microsoft declined a request for an interview, but a spokesperson said in a statement that the company is reallocating some resources from Longhorn to Windows XP Service Pack 2 (SP2), due later this year.

A component of Longhorn,

▸ continued on page 22

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NetBeans 4.0 to Feature Refactoring, Ant Integration

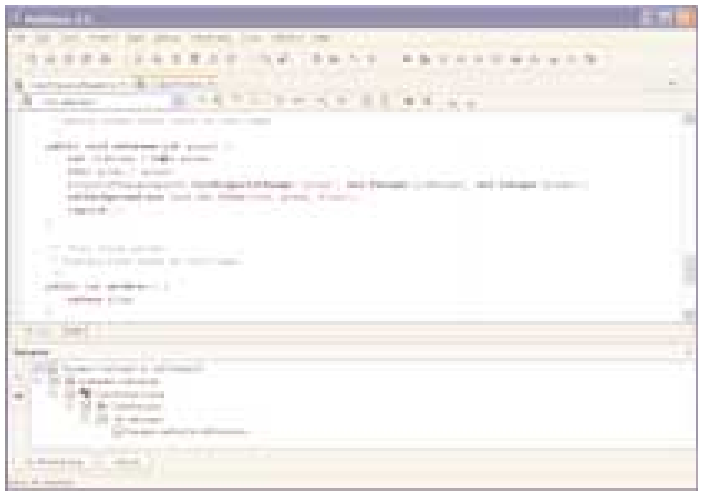
BY YVONNE L. LEE

Sun Microsystems Inc. in late March set a road map for the next major release of its NetBeans J2EE platform and IDE.

While NetBeans 3.6, which shipped in mid-April, sported a new interface, NetBeans 4.0, which is slated to ship in August, will feature a new project system that works with Apache Ant and will support changes in the Java programming language.

Developers use NetBeans' graphical interface to drag and drop elements necessary for a particular project. Then NetBeans itself generates the XML file that Ant will need to create the application build, said Steve Wilson, engineering director for NetBeans technology.

Another main feature in NetBeans 4.0 will be its support for refactoring, Wilson said.



Renaming is part of the new refactoring capabilities in NetBeans 4.0.

"What we basically mean [by refactoring] is taking large sections of your code and restructuring them to be more readable, more maintainable," he said. "Without tool support, this is something that can be very difficult."

The NetBeans 4.0 IDE will use a metadata repository to store information about the code's architecture, and then use this information to make systemwide changes to the code, he said. NetBeans 4.0 will be able to handle the find usages, move class, rename, change method signature, and encapsulate field refactoring commands, Wilson said.

As an example, Wilson said, NetBeans 4.0's refactoring support would find the occurrences of a changed name throughout an application and related files and change them all, so that the application could still function.

NetBeans 4.0 will run on J2SE 1.5 and, as such, will work with new constructs in the Java language.

"We taught the code editor what these constructs are, what they mean and that they're valid Java," said Wilson. "We know how to parse the newest Java language specification changes."

NetBeans 4.0 will include a configurable installation so that developers can install only the necessary parts for developing Web applications, mobile applications or both, Wilson said.

The 4.0 platform will have some interface changes, but Wilson described those as "refinements" compared with the major change in NetBeans 3.6. In that version, the company took a turn from prior versions, which featured the same windowing system regardless of operating system. Starting with NetBeans 3.6, Windows users will experience the XP interface, those using Mac OS X will see an Aqua interface, and those using Unix will see a GNOME theme.

Other NetBeans 3.6 features include the ability to collapse and expand sections of code, and drag and drop window movement.

NetBeans 3.6 is available for download at NetBeans.org. ■

JDeveloper 10g's ADF Opens J2EE Beyond Java

New components allow for assembly with XML

BY YVONNE L. LEE

Oracle Corp. in mid-April began shipping JDeveloper 10g, its integrated development environment for Java and Web services. According to the company, the software now has a set of components that make it usable even by those who don't program in Java.

These components are collectively called the Oracle Application Development Framework.

"[Oracle ADF is] a set of runtime classes that run on the application server," said Ted Farrell, chief architect for application development. "The purpose is to take away some of the complexities of J2EE development."

One thing that differentiates JDeveloper 10g from other IDEs, including Oracle 9i, according to Farrell, is that its output is XML documents. These documents link to programs on the server that perform specific business functions. So, the programmer either drags and drops programming elements onto the IDE or writes XML instructions, rather than programming Java, he explained.

"[With] Oracle 9i, which was like every typical IDE on the market, we sort of hit this wall. There was only so much more we could do," he said. "With these J2EE frameworks running, it really provided the framework for us to have these more visual environments."

The extra layer helps sell the software to organizations that have other Oracle products but don't have Java programmers, Farrell said.

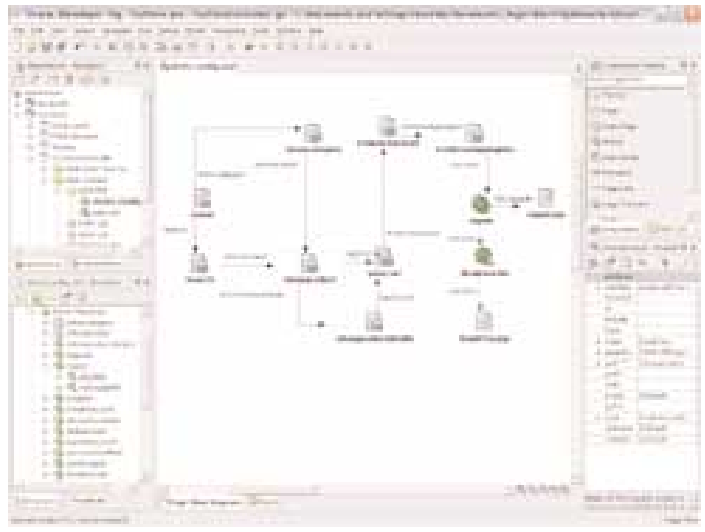
"When we walk into accounts, there's a lot of diversity with developers," he said. "Even though Java is growing, in the scope of the 8 million developers, [Java developers are] still only 20 percent."

The ADF also makes it easier to build applications based on a service-oriented architecture, Farrell said, because it is a framework created to accept and utilize component pieces that can plug into or be pulled from applications.

Although grid functionality is a major focus of the Oracle 10g server, Oracle's approach to running applications on grid infrastructures does not involve changing the applications themselves, so there is no specific support for grid computing in the JDeveloper IDE, Farrell said.

"Oracle believes there are no programming changes to take advantage of the grid," he said. "The grid handles it at runtime. If your IT manager wants to change your configuration at runtime, he doesn't have to go back to the developers."

JDeveloper 10g costs US$995 per named developer. ■



The visual editor in ADF enables application flows to be built by linking Struts components or by writing XML instructions.

ORACLE READIES RADIO FREQUENCY TOOLS

Oracle Corp. in late March introduced services for building radio frequency identification (RFID) applications.

Oracle's Sensor-Based Services consist of two middleware packages—a Compliance Package and a Pilot Kit—and are due in the third quarter of 2004. In January, the company announced that it would release a version of its Oracle Warehouse Management application and 10g database supporting RFID in the same time frame.

The Compliance Package includes a test application for organizations to meet the requirements of the U.S. Department of Defense and major retailers (Wal-Mart, European supermarket chain Metro and British supermarket chain Tesco) that have mandated that their business partners use RFID, which would replace bar-code systems in inventory control.

The Pilot Kit includes drivers for RFID readers, plus reporting and analytic tools to process RFID data.

According to Oracle spokesman Dan Race, the Sensor-Based Services will make it possible to capture and filter the data that is read from the sensors and store it into a common data store.

RFID systems use tags that respond to signals from radio transceivers. These sensors are used for applications ranging from pet identification to inventory control.

One advantage RFID systems have over bar-code systems is that the antennas can transmit and receive over a greater distance.

So, organizations can build a "smart shopping" system that automatically adds and decreases inventory counts as items are added and removed.

The Sensor-Based Services will be included as a feature in the next version of Oracle 10g Application Server, and will be available to customers with an Oracle maintenance contract, according to the company. —*Yvonne L. Lee*

News Briefs

COMPANIES

BZ Media LLC, publisher of SD Times, has announced the **Embedded Software Development Conference**, to be held Aug. 17–19 in San Jose. The three-day conference (www.esdevcon.com) will have technical sessions on embedded development in the enterprise, and will cover J2ME, Windows CE, Palm OS, embedded Linux and other high-level embedded topics . . . Catalog and Internet reseller **Xtras Inc.** is offering a new subscription-based service, Xtras.NET Developer Network Professional. The US$99 annual XDN Professional subscription provides .NET developers with one free tool per month, plus special half-price offers from its best-sellers list.

PRODUCTS

Cape Clear Software Inc. is offering **SOA Editor**, a tool for designing XML-based service-oriented architecture applications. The editor focuses on defining SOAs using WSDL files. Cape Clear is providing the tool at no charge for Linux, Solaris and Windows . . . **Studio Enterprise 2004 Version 2**, a suite of .NET components from ComponentOne LLC, will add a number of new controls, including XLS for .NET, a component that lets desktop and ASP.NET apps read Excel files; an enhanced Web data grid display; and a docking tab control. The suite costs US$899.95, and was to be available on April 23 . . . Rogue Wave, a subsidiary of Quovadx Inc., has shipped **LEIF 2.0**, an update of its Web services framework for C++. The new version offers faster SOAP processing than the initial release, plus support for request/response, asynchronous, one-way, server-side notification and server-side solicit response messages. The company also has updated its **Stingray Studio** graphical interface designer for Windows. The 2004 version includes an Excel read/write grid, and can expose some of its components to Microsoft's Visual C# . . . Corda Technologies Inc. has updated its components for .NET-based online charting, graphing and mapping. **PopChart 6.0** adds Macromedia Flash-based animations, box plot graphs, 3D bar and area graphs, step and thermometer graphs, new shadow effects, pop-up graphics, and other new graph types and options. **OptiMap 6.0**, which runs as a module within Corda Server 6.0, offers new line drawing between two arbitrary coordinates, shadows, fade-in animations within Flash images, and other new options. Pricing starts at US$1,590 for PopChart and $6,540 for OptiMap . . . Flashline Inc. has updated its **Flashline Registry** asset management system. Version 4.1 contains enhanced project-tracking capabilities that monitor compliance with mandated "must do" items for specific projects. It also can display reports on assets in progress and asset consumption . . . 4D Inc. has updated its **4th Dimension** (4D) relational database for Mac OS X and Windows. 4D 2003.3 fixed 79 bugs in the product, and also added new Mac OS X printing options, as well as the capability for clients to automatically reconnect to the server in the event of an unexpected disconnection . . . Borland Software Corp. has updated **CaliberRM**, its requirements management software. Version 6.0 supports inline images, and can incorporate use cases and design documents for expressing requirements, as well as standard text. It also can authenticate users against an LDAP database . . . Zephyr Development Corp. has unveiled two toolkits for integrating TN3270, TN5250, VT and SCO ANSI host applications. One tool is **Passport HLLAPI**, which offers a high-level language API for Windows applications to work with mainframes and midranges through terminal emulation. The **Passport Object Interface** exposes terminal sessions using an object-oriented API accessible by Windows programming or scripting languages . . . Information Builders Inc. is offering **WebFocus Quick Query**, a browser-based ad hoc reporting tool that can output database reports to HTML, Excel or PDF formats . . . Innoopract GmbH has released an update to its **W4T Eclipse** plug-in that allows it to work on Linux. W4T Eclipse is a scripting plug-in for the Eclipse open-source IDE that graphically composes Web front ends to Java applications. The tool

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JNBridge Updates Interoperability Tool

Java programs now can call .NET code directly

BY JENNIFER DEJONG

Making it easier for developers to build applications that include both Java and .NET code, Boulder, Colo.-based JNBridge LLC announced last month version 2.0 of JNBridgePro.

New to 2.0 is the ability for Java programs to call .NET code directly, said JNBridge's CTO, Wayne Citrin. In the previous version, 1.4, programs created in .NET languages could call Java code, and Java could respond via callbacks—a scenario Citrin described as "one-and-a-half-way bridging." By contrast, 2.0 allows programs to make calls in both directions, at the same time. ".NET and Java are total partners" he said.

Until recently, the demand for Java programs to call .NET was relatively small, noted Citrin. But as .NET matures, a heterogeneous environment is the reality. "Software developers are creating new products that interface with both Java and .NET," he said.

JNBridgePro looks at the .NET code the Java developer wants to call—or the Java code the .NET developer wants to call—and automatically generates the code required to create the linkage, said Citrin. It creates corresponding objects, where the .NET object looks like the Java object, and vice versa.

JNBridgePro is not integrated with the Java IDE used by the developer or with Visual Studio .NET, noted Citrin. "It is a side-by-side tool," he said.

Also new to 2.0 is the ability of .NET clients to discover more information about whom they are communicating with. "Am I talking to Java server A or Java server B?" asked Citrin. "The new version shows this."

In addition, 2.0 provides better garbage collection capabilities. "The developer no longer has to know that [Java and .NET have] different garbage collection mechanisms," said Citrin. When a .NET object is collected, the corresponding Java object is automatically collected, too.

JNBridgePro competes with Ja.NET, from Intrinsyc Software International Inc., in Vancouver, British Columbia. Both products use .NET Remoting, an object-oriented architecture for developing distributed applications, as the technical foundation. But JNBridgePro hides the technical details from the developer, said Citrin. For instance, when creating an object in Ja.NET, developers must specify the URL for the remote object to which it corresponds. In JNBridgePro, this isn't necessary. "It encapsulates the details of locating the remote object," said Citrin.

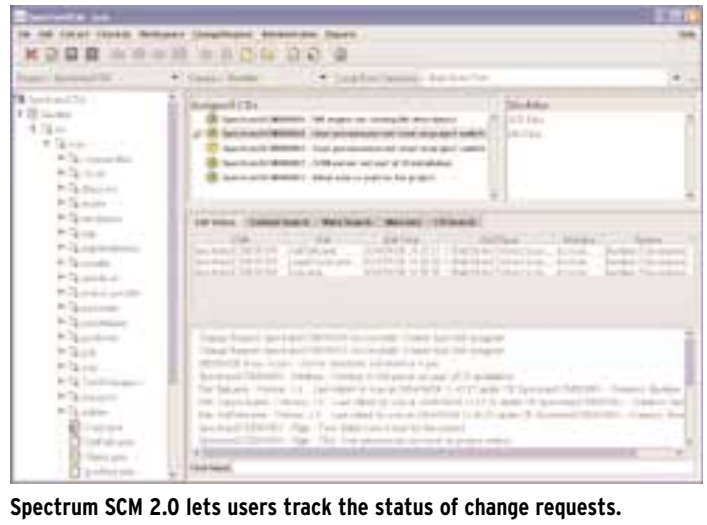
JNBridgePro standard edition, which supports J2SE, costs US$495 per developer, plus $95 for each desktop on which the application is deployed. The enterprise edition costs $2,495 per developer, plus $995 per server, or per 10 desktops on which the application is deployed. ■

Spectrum Broadens Configuration Tool

BY DAVID RUBINSTEIN

More robust work breakdown structures and a new Workspace Synchronizer are among the new features of SpectrumSCM 2.0, a configuration management tool set to be released on April 30 by Spectrum Software Inc.

Typically, change requests have to be written for most every task, according to Spectrum CEO Sarathi Srinivasan. With the new work breakdown structures built into the release, Srinivasan said parent-child and peer-to-peer relationships can be created that let project managers separate tasks from the feature set without having to create individual change requests for those tasks. With a new role-based access feature, developers also can view their project tree to see where their task fits into the overall change, he explained.



Spectrum SCM 2.0 lets users track the status of change requests.

The Workspace Synchronizer works over the Internet for distributed environments, allowing users to work offline and later synchronize their work with the original repository. Srinivasan cited the additional benefit of using the synchronizer to manage the work of contractors or other third parties involved in the development of a project.

Srinivasan emphasized that Spectrum's solution enables version control, issue tracking, process management, release management, workflow control and collaborative development. The price is unchanged at US$750 per seat, with a one-time $1,500 fee for the server repository. ■

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Fortify Attacks Security at the Application Level

Eliminating flaws early produces software that is inherently more secure, says company

BY JENNIFER DEJONG

Joining the burgeoning application security market, Fortify Software Inc. opened its doors for business last month with the launch of Source Code Analysis and Red Team WorkBench, tools that aim to secure software by eliminating potential openings for hackers as the application is being developed.

Traditionally, enterprises take a "perimeter defense" approach to security, using firewalls, virus protection and intrusion detection services, said Fortify founder and chief technology officer Roger Thornton. "But by securing applications from the 'inside out,' the software itself is able to withstand attack," he said.

Source Code Analysis includes a Developer Toolkit, Source Code Analysis Server and Software Security Manager. It analyzes C/C++ and Java applications by running the code against its database of more than 500 known vulnerabilities, essentially lines of code that a hacker could exploit.

One well-known software vulnerability, according to Thornton, is a "SQL injection" attack. "You have this innocent-looking code, which retrieves a record from a table, based on the constraint it has been given. But where did the constraint come from?" said Thornton. Using external input, such as code in a Web browser, a hacker could maliciously alter the constraint to retrieve all records, instead of just those originally specified, he explained.

The Developer Toolkit allows the developer to work in the Eclipse open-source framework or in Microsoft's Visual Dev Studio for C++. In the near future, it also will work with Borland's JBuilder and IBM's WebSphere Studio Application Developer (WSAD), as well as other integrated development environments, said Thornton.

When developers scan their code, Source Code Analysis pinpoints potential problems and issues a security warning. "It might say 'stack buffer overflow,' for example," said Thornton, noting a common vulnerability in C/C++ code. Clicking on the warning takes the developer to the line of code in question. Right-clicking the warning takes the developer to a page that explains the vulnerability and suggests secure coding techniques.

In order not to slow down the developer, Toolkit flags only the highest-severity risks. Source Code Analysis Server offers a more complete scan, comparing code with every known vulnerability in the Fortify database, noted Thornton. (The database resides on the customer's server and is updated against Fortify's master database as needed.)

The server product allows development managers to analyze the code of all projects under development on a nightly basis, he said. A third component of Source Code Analysis, Software Security Manager, is used to generate reports and metrics across multiple development projects.

Fortify's second offering, Red Team Workbench, is a collection of tools to run attack simulations, said Thornton. The goal is to "break" and then fix an application after it is developed, but before it is deployed.

Fortify is not the first vendor to take a application-level approach to securing software. Offerings from Sanctum Inc., in Santa Clara, are similar. "But with Sanctum's products, the application must be complete before you test it," said Thornton. "With Fortify, you test as you go along."

Another competitor, Reasoning Inc., in Mountain View, Calif., provides inspection services of source code. "They manually audit code and provide a report of vulnerabilities," noted Thornton. While that process is effective, it is time-consuming and expensive, compared with running Source Code Analysis every night, he said.

Source Code Analysis costs US$3,500 per developer desktop; the server component costs $50,000 per microprocessor. Pricing for Red Team Workbench starts at $20,000. Both products are available to pilot customers today and will be generally available at the end of second quarter of this year. ■

BORLAND TO STOP DEVELOPMENT, SUPPORT ON CODEWRIGHT EDITOR

BY JENNIFER DEJONG

Borland Software Corp. is phasing out CodeWright, the editor the company acquired when it bought Starbase Corp. in January 2003.

In an open letter posted on its Web site last month (www.borland.com/codewright), Borland tells its CodeWright customers the company is "not engaging in new development of the product, other than making bug fixes in accordance with valid existing support and maintenance contracts."

Borland will continue to license both versions of the code editor—CodeWright 7.5 and CodeWright for Visual Studio .NET—on an "as-is, unsupported basis" until the company determines it is no longer feasible to do so, according to the letter.

The letter said Borland will continue to provide support and maintenance to customers with existing contracts, but it will not renew support contracts when they expire.

The letter did not specify why the company is discontinuing CodeWright.

In a written statement, the company said, "Moving forward we are evolving the product line through our IDEs."

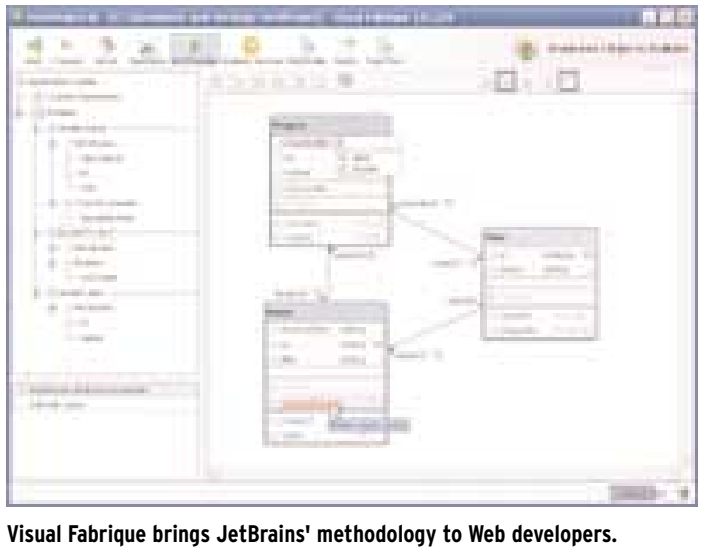
Borland's US$24 million acquisition of Starbase also included the requirements management system CaliberRM and the configuration management tool StarTeam. At the time of the acquisition, Borland's senior vice president of software products, Frank Slootman, indicated that CaliberRM and StarTeam would be integrated with Borland's development tools; there was no mention then of a future for CodeWright. ■

Another IDEA: JetBrains to Launch C#, RAD Tools

BY ALAN ZEICHICK

Building on the success of IntelliJ IDEA, a popular refactoring-oriented Java IDE, JetBrains Inc. is preparing to add a C# version of IntelliJ IDEA, to be called ReSharper, in the third quarter of this year, as well as Visual Fabrique, a new Web-oriented RAD tool, in the fourth quarter.

According to Eugene Belyaev, president and chief technology officer of the Prague, Czech Republic-based JetBrains, the ReSharper product is an add-on to Visual Studio .NET that will offer some of the same features as the Java-based IntelliJ IDEA but with less emphasis on refactoring. He said that the tool, which will be abbreviated R#, will be more intuitive than Visual Studio, which requires that developers begin typing the name of a command or object, and then fills in the rest. By contrast, ReSharper will be able to figure out through context what the developer wants even without typing, he said.



Visual Fabrique brings JetBrains' methodology to Web developers.

Belyaev also described a feature he called Live Templates, where after typing the shortcut for a template, ReSharper will analyze its context to automatically insert the required code, while substituting the values for many parameters.

For refactoring, Belyaev said the only feature that will be supported in the initial release will be the "rename" function. However, he said that subsequent versions will include the change method signature, introduce variable and extract method refactoring functions.

The Visual Fabrique tool, Belyaev explained, is designed as a Web-oriented development system, which includes an IDE for designing projects and pages, a compiler that translates those designs into ready-to-run applications, and a set of components and reusable controls. There is also a runtime component that works with J2EE application servers, he said.

"It's a RAD tool for high-level programming," Belyaev said, adding that some of the components will add Web-site functions such as discussion threads, forums, mailing lists, user management and security to Web applications. More information on Visual Fabrique should be available later this year, he said.

The company also is expanding beyond developer tools with OmniaMea, a .NET-based personal information manager designed to enhance Microsoft's Outlook with better support for instant messaging, newsgroups, RSS feeds and local file management. The application is scheduled for release in the third quarter, he said. ■

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Select Offers Solution for MDA Development

New transformations make implementations from models possible

BY DAVID RUBINSTEIN

After taking advantage of opportunities in component and process management, Select Business Solutions Inc. has again made modeling a priority with the release of Select Solution for MDA.

"The [component-based development] thing is here and happening, but those approaches back into modeling," said Hedley Apperly, Select's senior vice president and general manager. "We're focusing back on modeling as a mainstream thing."

The Select Solution for MDA is an add-on to the company's Component Architect tool and is used to identify existing models in terms defined by Object Management Group's Model Driven Architecture specification—either as a Computer-Independent Model (CIM), a Platform-Independent Model (PIM) or a Platform-Specific Model (PSM), Apperly said. The CIM layer, he explained, usually involves the business model, while the PIM is application modeling, such as plugging together components, services and interfaces. The PSM is a language-specific model.

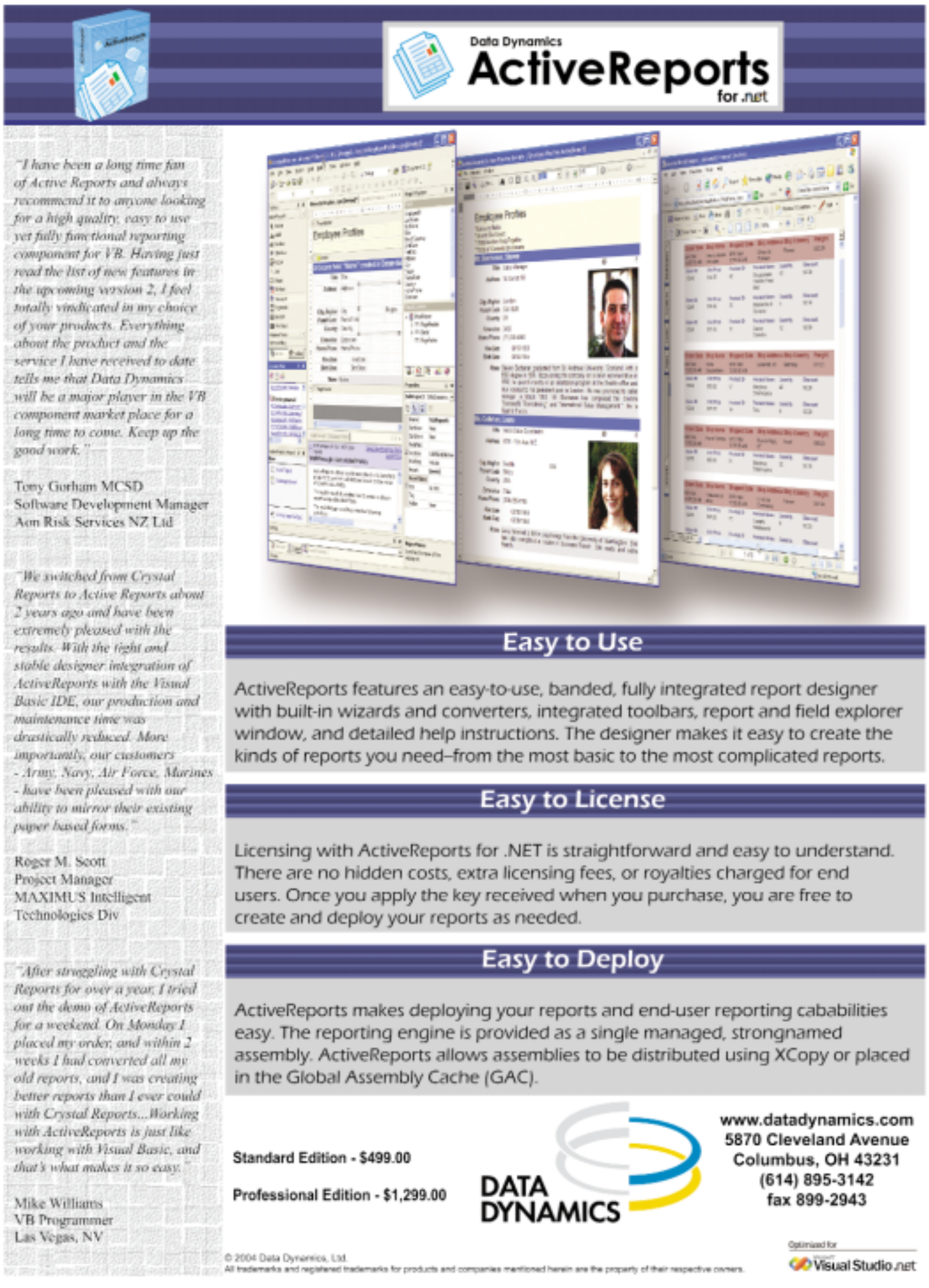
Apperly noted that large platform vendors such as IBM (with Rational's modeling tools) and Microsoft (with Visio, for now) are adding modeling into their development environments. "Rather than having a model that syncs with code in an IDE, we'll have a PIM that syncs with a PSM in an IDE. You can integrate with a model, not the language."

PRELOADED WITH PATTERNS

MDA hasn't caught on widely with developers as yet, Apperly explained, because the ability to transform a platform-specific model into a platform-independent model, or the other way around, was lacking. He said Select Solution for MDA "is preloaded with a mass of transforms [or patterns], for Java, C# and C++. Before, we didn't have an automatic way of elaborating the model between the layers. The PSM is one-to-one with code, and code generation off a PIM is a one-way thing that involves lots of scripting."

Bidirectional transformation now available in the Select MDA tool "lets developers take existing [Visual Basic] code into a platform-specific model, bring it up into a model for PIM, then back it down into Visual Basic .NET," Apperly said.

Apperly said Select's Component Factory suite integration with Visual Studio .NET is the newest and most feature-rich of Select's integrations, allowing Component Manager and the modeling tools to be run inside the Microsoft IDE. Component Factory already works in J2EE architectures, he said. Select Solution for MDA costs US$2,000 per seat. ■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Visual Studio .net

Business Objects Says Data Integrator Is Cleaner, Faster, Better

BY EDWARD J. CORREIA

With the release in April of Data Integrator 6.5, business intelligence software vendor Business Objects SA claims its ETL solution now includes more effective data cleansing and offers improved performance thanks to proprietary grid computing technology.

The company also is scheduled next week to release Data Mart Accelerator, a free add-on for users of Data Integrator 6.1 or later also using the company's Crystal Enterprise reporting tool that it says permits the creation of more targeted reports from data warehouses.

According to Darren Cunningham, director of data integration product marketing, customers using Crystal Reports were limited to creating reports only when batch updates were created, which he said limits report content to a snapshot. "The disadvantage is that you don't get the ability to look back in time to [perform] a trend analysis."

He claimed that with Data Mart Accelerator, data is pulled from transactional systems into a staging area, where it can be combined with data from other systems or even spreadsheets for historical analysis. "This helps Crystal [Reports] customers move from a reporting-centric environment to one that allows both snapshot and historical analytical reporting." Reports are created through a series of wizards, he added.

DATA CLEANUP

A new option for Data Integrator 6.5 enhances the cleansing capabilities of Designer, the tool performing the transformation part of the ETL process.

While the product already gave developers some visibility into data to be transformed, Cunningham said the new option integrates the name and address cleansing module from partner company Firstlogic's Information Quality Suite, giving Designer the ability to create profiles for cleansing data. "Now it's more of a visual component in the design environment," and also includes a number of predesigned data cleansing transformations that designers can drag onto their data flows.

The product also introduces a proprietary grid computing scheme. "As data volume and complexity grow, grid computing allows us to balance workload [throughout] a distributed environment of logically grouped servers," Cunningham said, adding that servers can be of like or unlike kind. "They can be all Windows, or some Sun, some IBM. The system is able to intelligently balance the load and throw some work to any underutilized server."

Available now for AIX, HP-UX and Windows, Data Integrator 6.5 costs between US$40,000 and $150,000, depending on server type and user volume. A Linux edition is due in the second half of this year.

Firstlogic's data cleansing module costs $50,000 per server with up to four processors for a single-country license. ■

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FYI: Data Visualization Tool Gets Web Services

BY JENNIFER DEJONG

Claiming to make it easier for Java developers to build applications that include visual representations of huge volumes of data, FYI Corp. of Atlanta announced last month version 1.5 of FYI Visual.

The data visualization tool is used to build business intelligence applications that extract massive amounts of information from multiple databases or enterprise systems, such as sales, financial, customer relationship management and enterprise resource planning, said FYI vice president of marketing Kathy Jaques.

FYI is essentially a Java toolkit that provides a mechanism for extracting data and offers an easy way for the developer to visually represent that data using shapes and colors against a graphical background, such as a map, she said.

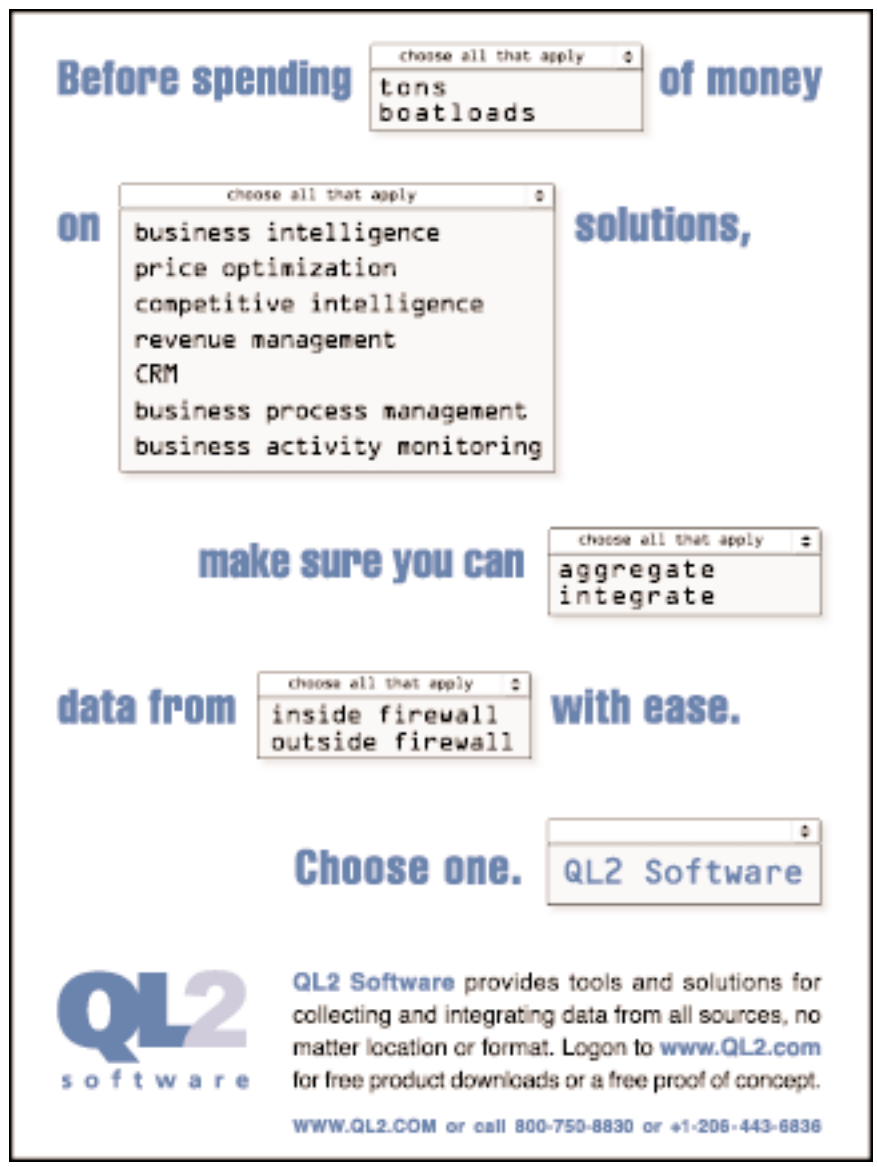
The idea is to give business executives a way to cognitively process thousands of separate metrics—such as monthly sales per salesperson or absenteeism rates per employee—simultaneously, without having to wade through individual reports from each database or application, said Jaques. For instance, an airline could use FYI to create an application that tracks real-time ticket prices for multiple flights, airlines and geographies. Or a bank could use it to create an application that monitors interest rates for dozens of financial products from hundreds of banks across different parts of the country.

New for Java developers in 1.5 is a Web services interface, which provides a standard way, using Web services wrappers, to connect to enterprise applications and databases they need to pull data from. "In the previous version, 1.0, developers had to write custom code to do that," said Jaques.

In addition, 1.5 provides a 25 percent improvement in database performance for Oracle and SQL Server, compared with 1.0, she said.

Founded as Identitech Inc. in 1987, the company was renamed FYI Corp. in March 2004, following the sale of its electronic document management systems assets to eiStream Inc., of Dallas, in February 2004.

Pricing for FYI Visual is based on the number of metrics monitored. Licenses start at US$150,000 for 5,000 metrics, and $250,000 for 10,000 metrics. ▮



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Software FX gets a taste of its own medicine

Self implementation increases understanding of customer needs

Most developers agree that the one thing you can count on with code is that it will change. When changes happen, most of us don't have the time to go through each line of code. Although components aren't an absolute requirement for development, they can save you significant time when making code changes. Components reduce the mundane engineering that developers worry about like portability, interoperability, scalability and performance. And that's a big advantage.

So, if you think of components not as something that eliminates the need to write code, but instead as something that makes the process of writing code in a larger system manageable; you may have come up with a solid conclusion. The understanding that having a component-based application is important, not because somebody told you so, but because you understand the benefits it brings to the development process.

Chart FX for .NET shown with the ▲ Wizard and the ◀ Resource Center within Visual Studio.NET.

During the porting of Software FX's corporate intranet to ASP.NET that we came to experience and realize what .NET had to offer and the challenges involved with porting a functional application to a new platform. To us it was like *a taste of our own medicine*, as most of our intranet reports were built using our own product, Chart FX.

Interestingly, our developers had little problems or concerns connecting Chart FX to a myriad of data sources like SQL, XML and text files coming from external distributors. Similarly, they didn't report any security, performance or scalability issues; or complain about porting old Chart FX code, most of which were legitimate concerns when we decided to make the switch to .NET.

Instead, we quickly realized our developers spent an unusual amount of time coding business rules and logic that would help upper management visualize areas that needed attention to make critical business decisions. Ultimately, we concluded that developers could not divorce themselves from coding and configuring data-presentation components since they were coupled directly to the data extraction process. Therefore, they couldn't embrace the code-behind concept that separates code from the presentation layer. For example, we wanted chart markers to be colored according to a certain condition and provide drilldown capabilities to find the root of such situations, this had to be done by carefully inspecting the data and coding such conditions into the application.

This way their main coding effort was invested in making the chart reflect these conditions, yet they were able to come up with truly astonishing charts in terms of presentation. The Chart FX for .NET Wizard and Resource Center were crucial to achieving this goal with little or no development efforts on their part. To us, that was a major accomplishment since Chart FX for .NET provides over 800 properties, methods and events that they didn't have to learn before they could be productive with our tool. The last thing you want to do when porting an application to .NET is spend significant resources learning how third-party components work and behave.

From Primary Care to Specialist

However, in the end we found ourselves in a situation where the GUIs, and especially the charts, were tightly bound to the data. And as a result, if any business rules changed or any of our data itself changed, it had this tremendous rippling effect throughout our code. We knew this situation would make our intranet unable to respond to future business needs. In other words, an application that although built with the latest .NET technology, was resistant rather than resilient to changes.

This situation reached dramatic proportions when our developers were investing countless hours trying to satisfy the information needs of our sales, marketing and support departments. At this point, they were concerned that we were diverting from the original project and were still far from completion.

The solution, to us, was simple: *Chart FX Extensions*.

With these extensions, Chart FX provides easier integration to connect more meaningfully with your data. This means developers are no longer required to spend countless hours configuring a generic charting component to specific data. Instead, the Chart FX Extensions can be stitched together to adapt to data sources enabling organizations to quickly and economically gain access to specialized solutions that meet unique business needs.

To the right are a series of snapshots about the Chart FX Extensions and how we were able to consume them for our own benefit. In the end, Chart FX had the cure for what ailed us.

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This is performed by a different set of queries that integrate data from our internal point of sales system as well as data coming from external distributors, each of which has its own different IT system. We ended up with an ASP.NET page that would take data from a variety of sources, including SQL and XML, and map the data using universally supported SVG images. **Chart FX Maps** would simply take this data source and would allow logical groupings and views that would otherwise take weeks to code. Get more information at www.softwarefx.com/maps.

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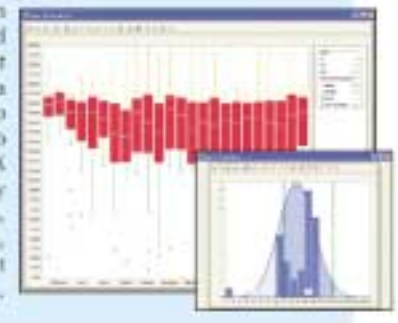

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IBM Jazzes Up Collaboration

BY JENNIFER DEJONG

Researchers at IBM Corp. are working on collaboration technologies aimed at easing communication among members of development teams, according to the company.

"There is a common scenario where one team member makes a whole pile of changes and breaks [another developer's] code," said Mark Wegman, a researcher at IBM's T.J. Watson Research Center in Hawthorne, N.Y. "One guy just explodes at the other."

Because development projects today span multiple applications and databases, the team approach is here to stay. "But the bigger the team, the greater the drop in productivity," said Wegman, noting that the need for developers to communicate among themselves eats away at coding time.

IBM researchers in Cambridge, Mass., are working on one potential solution to that problem. Not yet a commercial product, Jazz is a set of features designed to create what is essentially a virtual open office made up of people who code together, said John Patterson, a distinguished engineer in the Cambridge research center.

Jazz displays photographs of team members in a buddy list format and lists the files each is working on, said Patterson. Using visual symbols, it lets developers know which files have been modified and checked in or out and alerts them to potential collisions, he said.

Developers can launch chats with team members by clicking on photographs. "You can populate a chat with a segment of code, and then save the code so others can see a conversation about this particular code segment has taken place," said Patterson.

Jazz also allows developers to do a "quick dif" against code on a teammate's workstation, even if that code isn't checked in.

Patterson said Jazz technology is likely to appear in IBM Rational tools or in WebSphere Studio Application Developer (WSAD), but he did not say when that might happen. ▮

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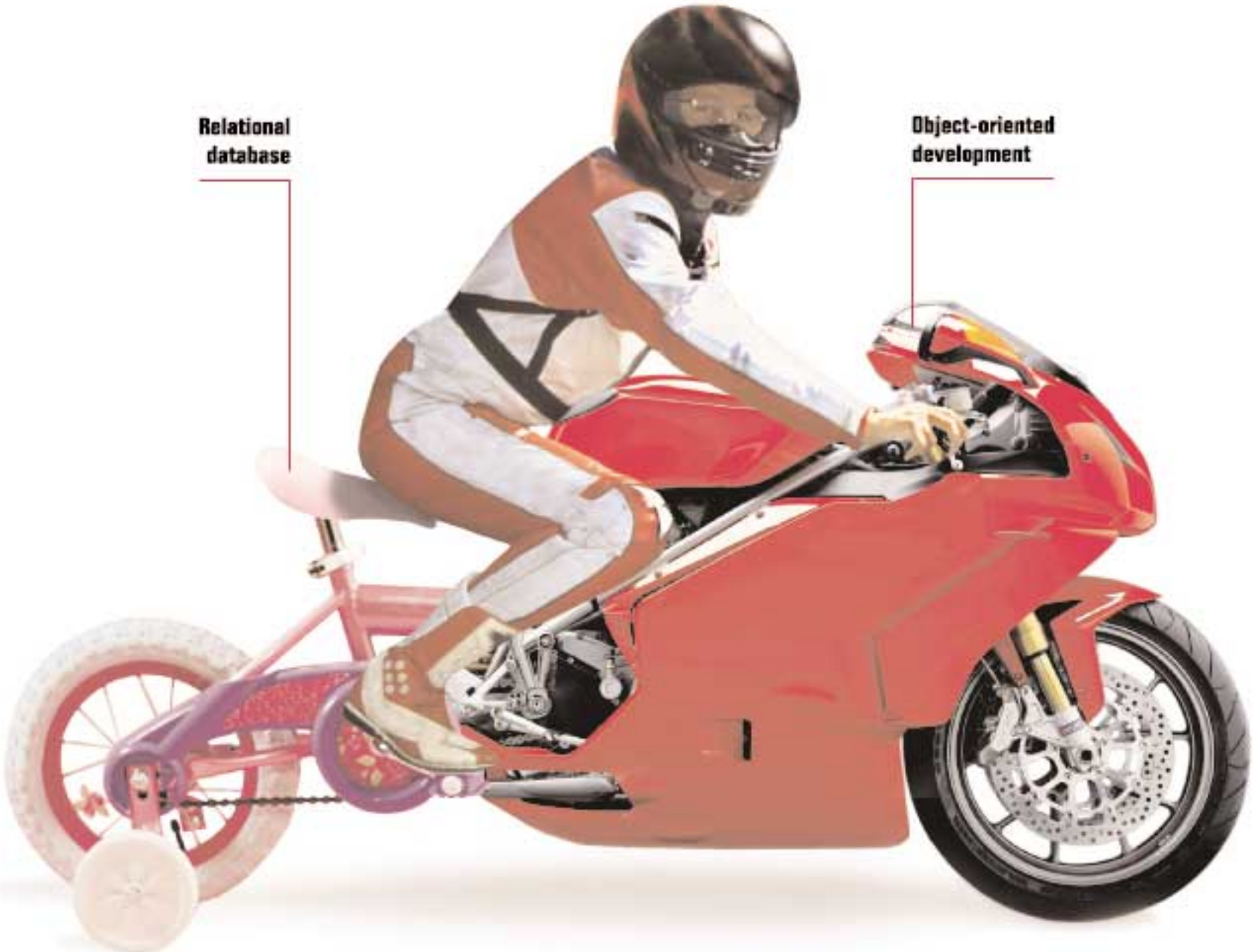
Magic's iBOLT Is on the Air

BY EDWARD J. CORREIA

In response to mandates by the U.S. Department of Defense, the Food and Drug Administration and major retailers, Magic Software Enterprises Ltd. in mid-April added a radio frequency identification (RFID) component to its iBOLT Suite, permitting companies using the integration and development tool set to incorporate RFID in their supply-chain management systems. The update is free to all iBOLT current licensees.

According to Glenn Johnson, Magic's director of corporate marketing, the technology, which employs tags that can be affixed to packages and scanned from a distance, allows storage of more information than simple UPC codes and eliminates the need for line-of-sight package scanning. "RFID devices can track as much as a megabyte of XML information, which you can read and write. So the RFID tag becomes a live record of what's happening with that shipment," he said. ▮



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A Proforma Way of Collaborating on Enterprise Models

Company's J2EE application allows Web-based distribution of architecture assets

BY DAVID RUBINSTEIN

Traditional enterprise modeling solutions, according to Proforma Corp., have been designed to be accessed over a local network by a small number of architects. But Proforma believes a company's system models, business processes and underlying data are the intellectual capital of the enterprise and should be made available to as many users as possible, regardless of where they work.

To that end, the Southfield, Mich.-based company on April 14 released ProVision 4.4, an update of its enterprise modeling suite that includes a new ProServer, a Web application that runs inside a J2EE servlet container and uses JDBC drivers to send objects down to the ProVision client.

"The demands to exchange data across the globe are growing," said Ron Pellegrino, president of Proforma. "When you access a repository over a [wide-area network], you run into performance issues. We've developed some sophisticated Java-based server technology that allows access to models in a central repository over a WAN in a quick and efficient way."

The ProVision client communicates with the server using XML-based messaging over HTTP, according to senior architect Mike Anthony. ProServer calls the repository and sends a copy of the data to a cache on the client, where it can be viewed or edited. The enterprise models are stored as blobs in the database; the company is certifying the server against Oracle and SQL Server for this release, Anthony said. Users can partition the repository into logical name spaces, or notebooks, then select objects from the notebook to check out.

The client-side ProVision Enterprise Pro, which sells for US$3,500 for a single license or $35,000 for a five-user floating license, comes with 23 different modelers, a simulator for running workflow scenarios, a new Framework Manager that supports such frameworks as Six Sigma and Zachman and allows customization, and a new ModelXtender, which allows the ProVision repository metamodel to be extended with new business objects. ProVision ProcessPro, which sells for $1,500 for a single license or $15,000 for five users, limits the set of modelers to process.

To run ProServer, which costs $5,000 per processor, the client piece must include Proforma's TeamWork, which provides the access to the server. TeamWork was originally what allowed ProVision users to share models and other contents of a repository across a local-area network before ProServer was introduced. TeamWork costs $1,000 for a single license or $10,000 for a five-user floating license. ■

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SUN, MICROSOFT

◂ continued from page 1

crosoft making an upfront payment of $350 million, while Sun will make payments when Microsoft's intellectual property is incorporated into its server products. The two companies declined to specify what the $350 million was for, saying only that Microsoft would be incorporating Sun technology into server products.

Microsoft and Sun have agreed not to sue each other with respect to all past patent infringement claims they may have had and are negotiating a patent cross-license agreement.

With this agreement, the two companies are terminating their lawsuit in the United States, and Sun says it also is satisfied that the agreements meet the objectives it was pursuing in the European Union actions.

In addition to the legal settlements, the companies agreed to collaborate on server products, which Sun said in a release would center on future Windows servers. The two companies will work together to allow identity information to be shared between Microsoft Active Directory and the Sun Java System Identity Server.

As part of the agreement, Sun will license the Windows desktop operating system communications protocols under Microsoft's Communications Protocol Program, established pursuant to the court's consent decree and final judgment against Microsoft in the antitrust case brought against the company by the U.S. Department of Justice and 18 state attorneys general.

THE MAKINGS OF A DEAL

As a result of the settlement reached by Sun and Microsoft, the following terms were established:

- Microsoft will license Sun technology for inclusion into future Windows Server and Windows Client products.
- Microsoft eventually plans to add Sun technology in e-mail and database products.
- Sun and Microsoft engineers will work together to enable identity information to be shared between Active Directory and the Java System Identity Server.
- Sun will sign a license for the Windows desktop operating system communications protocols under Microsoft's Communications Protocol Program.
- Both companies will work to improve technical collaboration between Java and .NET.
- Microsoft is allowed to continue to license and support JVM 1.1.4.
- Sun's Xeon servers received immediate Windows certification.
- Certification for Sun's Opteron-based servers is moving forward.
- The two agreed not to sue each other with respect to all past patent infringement claims and with the potential for future extensions of this type of covenant.
- The two are settling and terminating their lawsuit in the United States with Sun indicating that the agreements satisfy the objectives it was pursuing in the EU.

Source: Sun Microsystems Inc.

MICROSOFT KEEPS LICENSE

In a major concession by Sun, Microsoft will be allowed to continue to license JVM 1.1.4. The two companies are still negotiating whether Microsoft also will license future updated JVMs, according to a Sun spokesperson.

The concession at least allows Microsoft to continue supplying its customers with some version of the JVM, albeit an outdated one, said IDC's Kirzner. "It's a concession on Sun's part, but it also means there will be a migration path."

Sun spokespeople reiterated that several computer manufacturers now ship the latest JVM with their Windows PCs and that it also can be downloaded from java.com.

The two companies announced Windows certification for Sun's Xeon servers, as well as for its AMD Opteron-based servers. Sun and Microsoft agreed to improve collaboration between Java and .NET, but Sun chairman and CEO Scott McNealy said that did not mean that there would be a merger of C# and Java or between the .NET platform and J2EE.

The tenor of the conference was in sharp contrast to the companies' previous rancorous statements. Asked whether he believed that Microsoft's behavior, which he had criticized, had changed, McNealy would say only that the relationship in the meetings between the companies' high-level officials was "very professional." He said Microsoft was no longer "clamped down."

Both Ballmer and McNealy mentioned repeatedly that the moves were made at the request of customers.

The two executives insisted they will continue to compete despite the détente, albeit with less acrimony.

"We're going to continue to compete," said Ballmer. "The thing I don't think you'll hear from either one of us is [that] anything's welded shut."

"The customers do not want us to stop competing," echoed McNealy.

"Developers get relief from continuing to have to deal with

▸ continued on page 19

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SUN, MICROSOFT

◂ continued from page 18

interoperability," said IDC's Kirzner. "The majority of their large customers have heterogeneous environments."

Sageza's Ryder said the two companies may be joining together to fend off a common foe, IBM.

"Microsoft and Sun are actually more alike than they are different," he said, pointing out how the two are led by entrepreneurial founders and tend to sell complete solutions, as opposed to IBM, which sells services and software of its own as well as from other companies.

The announcement of the easing of tensions came the same day Sun announced that, based on preliminary results, it expected a net loss for the quarter that ended March 28, 2004, to range between $750 million and $810 million, and that based on this loss, it was restructuring both its property portfolio and its work force.

This loss includes charges of approximately $350 million for an increase in the valuation allowance for deferred tax assets, and approximately $200 million for work-force and real-estate restructuring.

Excluding these charges, net loss for the quarter would range between $200 million and $260 million, or a net loss per share range of 6 cents to 8 cents.

Sun will cut its work force by approximately 3,300 people. However, McNealy declined to state where those cuts would come.

"We will be working on it on a global level over the next five to six weeks," he said. He added that he did not have details.

SCHWARTZ PROMOTED

In addition to announcing the financial results and the rapprochement with Microsoft, Sun announced that it had elevated Jonathan Schwartz, who had served as executive vice president of software, to the company's president and chief operating officer.

John Loiacono, formerly senior vice president of Sun's operating platforms group, will become the new executive vice president for software. ■

Quest Queries Memory

BY YVONNE L. LEE

Quest Software Inc. in late March began shipping an update of its JProbe Java and J2EE memory analysis tool suite with an aggregate memory footprint analyzer.

This new tool is designed to show not only how much memory an application uses, but also the net affects of adding objects and frameworks to a program, said Jeff Zado, director of product marketing for JProbe.

According to Zado, the new feature makes it possible to see the hidden memory costs of using a particular framework or adding an object.

JProbe 5.2 also has Ant integration, which Zado said can automate the memory analysis tasks into the nightly build process.

The JProbe suite is designed to help diagnose and resolve performance bottlenecks, memory leaks, excessive garbage collection, threading issues and areas where testing may not be complete.

It includes JProbe Profiler, which is designed to identify method and line level performance bottlenecks; JProbe Memory Debugger, for investigating memory leaks and garbage collection activity; JProbe Threadalyzer, for finding thread deadlocks, stalls and data race conditions; and JProbe Coverage, for measuring code coverage after quality assurance testing.

Quest JProbe Suite 5.2 is available now for US$2,000 per seat for an individual license and $7,000 per concurrent license. The concurrent license server not only tracks available license tokens, but also records peak usage and the number of misses, helping organizations buy the most cost-effective combination of additional licenses, Zado said. ■

JProbe Memory Debugger displays memory usage, object allocations and garbage collections.

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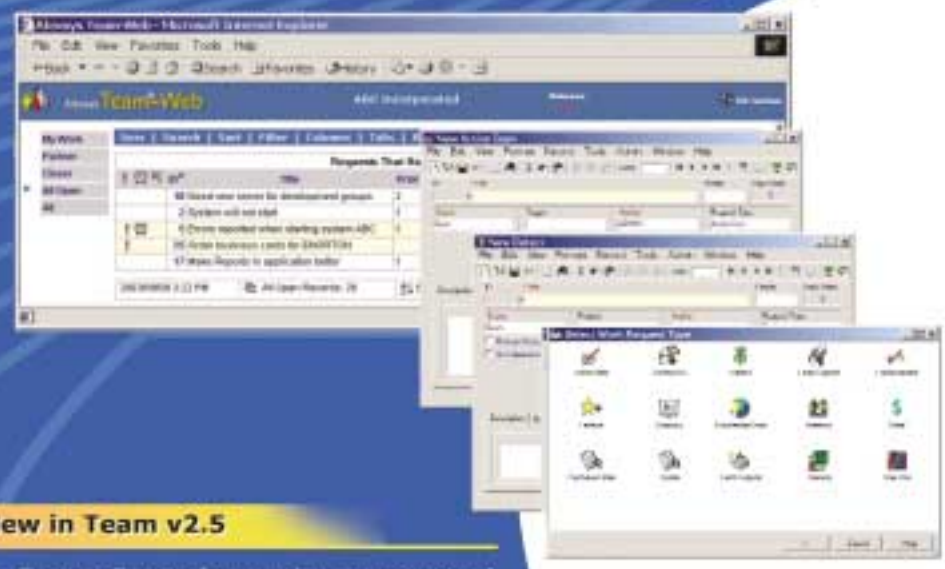

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— The Information Habits of Embedded Engineers, VDC, January 2004

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Ted Bahr
Ted, president of BZ Media and of the Embedded Software Development Conference, was the founder and driving force behind the Embedded Systems Conference and Embedded Systems Programming magazine. Ted is well-known as a visionary and evangelist for embedded software development.

Alan Zeichick
Alan brings more than 25 years of experience as a systems analyst, software developer and technology consultant to his role of editor-in-chief of SD Times and co-chairman of the Embedded Software Development Conference.

Edward J. Correia
One of the software development industry's most respected high-tech journalists, and a hands-on technologist, Edward has edited the Embedded & Wireless section of SD Times for more than four years. He's the go-to guy for what's happening in embedded software development, and co-chairman of the Embedded Software Development Conference.

Donna Esposito
The show director for the Embedded Software Development Conference, Donna had been vice president for electronic events at CMP Media LLC, and was responsible for managing both the Embedded Systems Conference and Embedded Systems Programming magazine.

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News Briefs

MORE PRODUCTS

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costs US$129 or €138 per developer seat; runtime licenses range from $199 to $2,999, or €207 to €2,898 . . . The Belgian company Atomikos BVBA is now offering **TransactionsJTA**, a transaction monitor for J2EE and J2SE applications that ensures that multistage transactions complete correctly; if not, the database is rolled back via JDBC or JMS. Development licenses are free; per-server runtime use ranges from US$302.50 for three concurrent connections to $3,025 for 20 connections . . . The Australian firm C Point has enhanced its **Antechinus C# Editor**. Version 6.0, which sells for US$49.95, adds a visual forms tool and has more extensive facilities for adding rich code comments that include links to Web pages and external documents . . . IBM Corp. has posted a number of new tools to its **alphaWorks** Web site, including an advanced pattern search toolkit, an XQuery normalizer and static analysis tool, a dictionary and thesaurus API for Java, a data viewer for XML, and tools for moving services from one host to another . . . Sims Computing Inc. has updated its **Flux** job scheduler. Version 6.0 adds workflow and business process management features, along with better security and exception handling . . . Etnus LLC has updated its **TotalView** debugger to work with Novell SUSE Enterprise Linux 8.2 and Red Hat Linux 3.0 for Itanium. Version 6.4 of TotalView also adds a new expression list window and a data window for monitoring variables and structures, and can handle multithreaded core files . . . RMTrack Issue Tracking Solutions Inc. has updated its **RMTrack** defect tracker. Version 2.0 adds new advanced configuration options, issue numbering, enhanced reports and stronger security. The software costs US$299 per user . . . To version 5.2 of its **UltraLightClient** software library for Swing-based J2EE applications, Canoo Engineering AG has added support for drag-and-drop user interaction, as well as better memory management . . . DBI Technologies Inc. has updated **Extractor**, its SDK for incorporating text summarization into applications. Version 7.2, which extracts words, phrases and context from text, HTML and e-mail messages, offers improved keyphrases and highlights in English, French, German and Spanish; increased support for special punctuation characters; and improvements to wrappers for calling Extractor from Java, Perl and Python under Linux, Solaris and Windows.

PEOPLE

FELDMAN

The Association for Computing Machinery has given its Software System Award to **Stewart Feldman** for his creation of the make utility in 1977. Feldman is currently VP of Internet Technology at IBM Corp. . . . **Erich Gerber** is the new CEO of Interactive Objects GmbH, a German company that sells Model Driven Architecture tools. Gerber, who most recently worked at WebGain and BEA, replaces founder **Richard Hubert** in that role . . . Dublin, Ireland-based integration software vendor PolarLake Ltd. has appointed **Peter Melroy** as the director of its North American office . . . **Antonio Bigazzi** is now director of compiler technology for Accelerated Technology, a division of Mentor Graphics Corp. Previously, he worked at Microtec Research, which was acquired by Mentor.

STANDARDS

The International Organization for Standardization has approved a set of ebXML specifications created by OASIS. Now under the ISO 15000 family of standards for electronic business using XML, they are ISO 15000-1 **ebXML Collaborative Partner Profile Agreement**; ISO 15000-2 **ebXML Messaging Service Specification**; ISO 15000-3 **ebXML Registry Information Model**; and ISO 15000-4 **ebXML Registry Services Specification** . . . The World Wide Web Consortium has approved **Document Object Model Level 3** as a W3C Recommendation, which is the term the group uses for finished standards. DOM Level 3 extends the Document Object Model to include XML 1.1, XML Schema 1.0 and SOAP 1.2. ▮

MICRO FOCUS

◂ continued from page 1

and includes ATMs, point-of-sale terminals, and most other online transaction processing systems. "Perform any transaction today, and odds are you're going through CICS," he said.

To make the trip from mainframe to micro, Archbell said that most COBOL and CICS applications will remain more or less unchanged. "We're supporting a vanilla COBOL and CICS platform, so if you've got a standard CICS/COBOL application, you'll be able to move it over. But this isn't something that in all cases will drop in," he warned. Compatibility problems are likely to arise, he said, with apps developed with nonstandard databases or 4GL languages such as Software AG's Natural or CA's Ideal. "You're not going to be able to move those applications without some changes." Archbell said an extensive partnering program is intended to ease such migrations.

Most standard CICS/COBOL apps will run unchanged on MTO, says Micro Focus' Archbell.

Micro Focus also has partnered with Microsoft Corp., which Archbell said is providing marketing and technical expertise. "We'll have one or two people in Redmond working with Microsoft on new technologies, and ensuring similar quality of service that mainframes have been known for." He said typical target Windows servers would include Microsoft's Enterprise Server 2003 and DataCenter Server.

Available now for Windows, Mainframe Transaction Option (MTO) pricing starts at around US$25,000 and varies by application and user volume. Linux and Unix editions were scheduled to be generally available in June. Performance of the CICS engine and the application runtimes is controlled through a Web browser. ▮

FAIR ISAAC

◂ continued from page 1

from Fair Isaac's scorecard development technology, in which the company tools provide data access, generate scorecards and create regression models, all designed to help its customers make better business decisions based on the analytics of that data.

Taylor explained that being able to more finely divide a customer base gives a company competitive advantages. Using insurance underwriting as an example, Taylor said, if one company charges US$1,000 for everyone in a risk category, but a second company can split that level of risk into two and charge $700 for the better customers in that risk and $1,300 for the worse customers in that risk, the second company will attract all the better risks in the group and leave the poorer risks to the first company.

The same holds true for credit-card companies, he added. If a company can offer regular payers better interest rates than slow payers, that company will attract better payers, who also might charge on their cards more because the rates are lower, he explained.

The EDM framework includes a new process designer built into Blaze Advisor 5.5 that ties rules and models together to create a decision application. The tool has been improved to be able to understand the scorecard metaphor to represent business rules, Taylor said, along with better set handling and support for more application servers. Model Builder 2.1 has better mainframe integration and also builds on the scorecard technology, he added. Business management and simulation capabilities have been built in to the modeling environment to allow users to see what happens if the data score changes, and then run a simulation of profitability based on the new data.

The framework allows business rules to be plugged in on-the-fly, giving businesses the flexibility to adapt to changing needs.

"Many apps can never be finished because the business guys can't decide on the requirements because the business is changing so rapidly," Taylor explained. "Decision-making is not a one-time event," he said. "You have to be able to flow decisions back into the system, to see the impact of those decisions. Can you change your risk tolerance, or be more aggressive on [customer] retention" and still turn a profit, he asked.

The EDM platform ranges in price from $400,000 to $500,000, depending upon the number of transactions; large applications could run the cost up into the millions, Taylor said. ▮

LONGHORN

◂ continued from page 1

SP2 adds security features to the Windows operating system, defending against viruses, worms and hackers.

Meta Group Inc. vice president of research services Tom Murphy said that while the delay is hardly surprising, it creates disappointment among developers. "[Microsoft] has been pumping them up, feeding them early access releases and pushing them to get running on Longhorn now. [Developers] get psyched for the release, ready for the beta, and then—boom!—it slows down."

"You begin to wonder about [Microsoft's] ability to produce schedules for any of [its] software," added Forrester Research Inc. principal analyst Uttam Narsu. "But I don't think the delay is a big deal for enterprise developers."

It does, however, create an opportunity for Macromedia Inc.'s Flash MX rich client software, Narsu said, since Microsoft is expected in Longhorn to introduce "Avalon," its own rich-client technology. "I have clients saying, 'Should I go with Macromedia?' " he said.

Narsu also noted that "Indigo," Longhorn's Web services communication subsystem, is the key piece of Microsoft's service-oriented architecture (SOA) vision. Its delay presents opportunities for J2EE vendors that are expected to announce SOA products in the near future. He declined to specify which companies he was referring to, but said the arrival of the products could slow the growth of .NET.

The final version of "Longhorn" was originally expected in 2005. Microsoft did not say when it will be ready. "But I'd be surprised if [the delay of the beta] were the only delay we see until it ships," said Gartner Inc. vice president and research director Mark Driver. ▮

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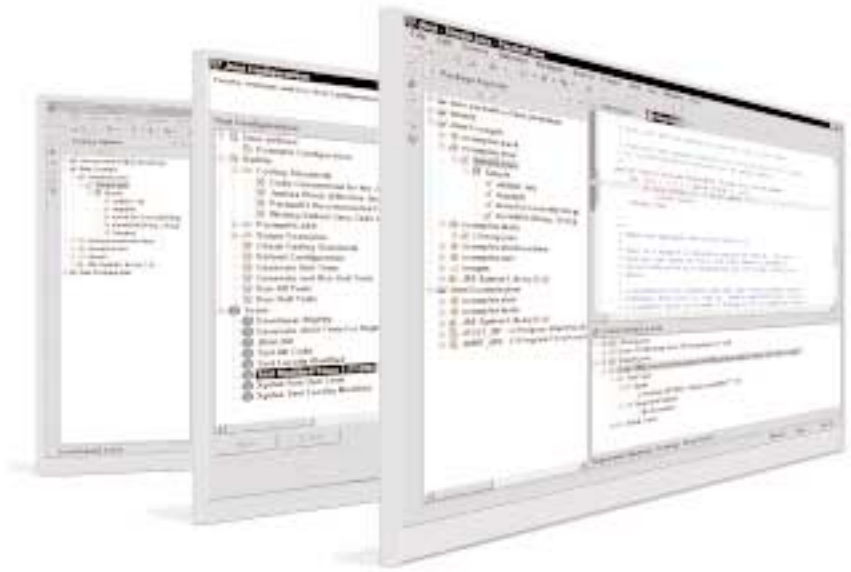

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At ESC, Operating Systems Take Center Stage

Software vendors share spotlight at electronicaUSA

BY EDWARD J. CORREIA

Operating-system updates and revisions came to the fore at electronicaUSA with the Embedded Systems Conference, CMP Media LLC's first presentation of the popular developer conference being folded into the largest hardware component and device expo.

Accelerated Technology, the embedded systems division of Mentor Graphics Corp., unveiled Nucleus SIM and Nucleus SIMdx, versions of its Nucleus RTOS that the company says enable developers to create prototype embedded systems in the absence of hardware. The software extends Accelerated's Nucleus MNT prototyping environment for Windows. Nucleus SIM environments also run on Linux, and SIMdx adds support for hardware peripheral and networking emulation, including Bluetooth and GSM. Pricing starts at US$1,995.

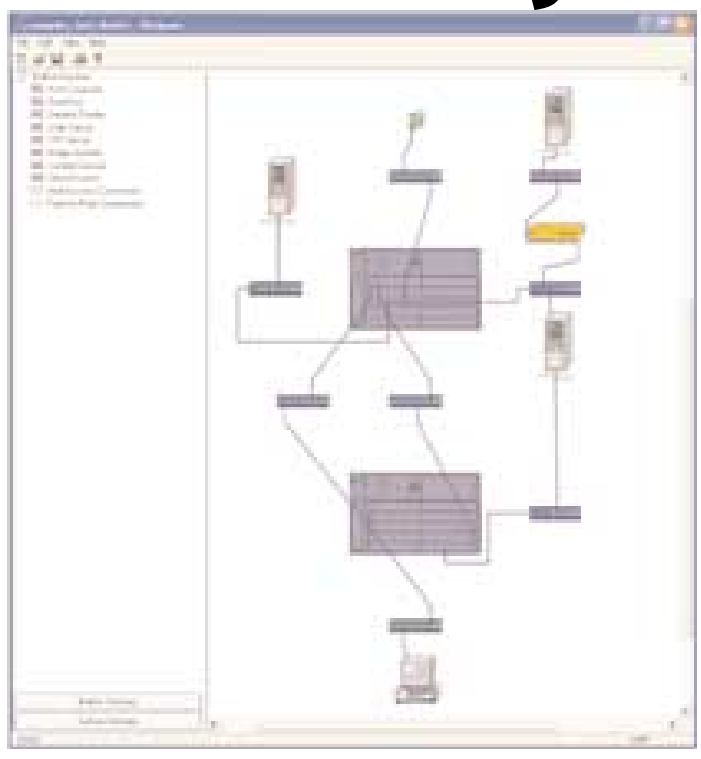
In addition, Accelerated released several new class drivers for its Nucleus USB plug-and-play RTOS software that support USB mice, keyboards and other human interface devices, and printer and virtual serial class drivers that the company says enable legacy serial devices to easily migrate to USB. Nucleus USB pricing starts at US$14,995; the new class drivers start at $2,995. Prices include source code; there are no royalties.

Devicelogics Inc. began shipping DR-DOS 8.0, the latest version of its operating system intended for single-task, single-application embedded systems. The new software now supports large partitions under the FAT32 file system; pricing starts at US$200 for a five-user license. The company also released DRLX 1.0, an application for DR-DOS that launches a Linux 2.4 kernel and Linux application from FAT32, and simplifies development of Linux-based systems and migration from DOS- to Linux-based embedded systems, the company says. The kernel reportedly supports hard and soft real time, TCP/IP, Flash memory and all Linux features on *x*86 platforms. Prices are negotiated individually. Devicelogics also released KDeBUG, a $499-per-seat Linux debugger based on kernel patches developed by SGI.

RTOS developer **Green Hills Software Inc**. began offering Velosity, the microkernel of its Integrity RTOS, as a separate entity, positioning it as a stand-alone operating system for handheld computers, mobile communicators and other resource-constrained devices. According to the company, Velosity, which operates in about 3MB RAM, employs an architecture that does not disable interrupts in system calls, which it claims guarantees fast response. The royalty-free microkernel works with Green Hills' existing Multi IDE and C/C++ compilers and is hardware-independent, thereby requiring no board support package development on supported platforms, including ARM, Coldfire MIPS, PowerPC, *x*86 and XScale. Development licenses start at US$9,500.

Express Logic Inc. introduced a memory protection option for its ThreadX royalty-free RTOS, allowing developers

▸ continued on page 26



DoubleWide Studio now enables testing of multiple interconnected systems.

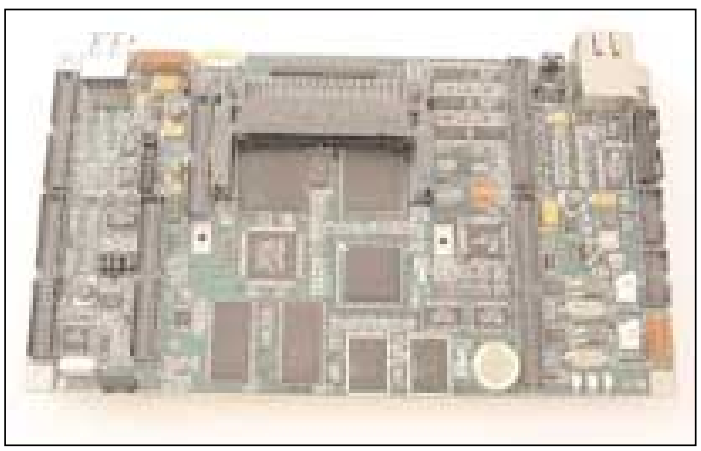
XScale a Recurring Theme at electronicaUSA

BY EDWARD J. CORREIA

Enterprise developers attending this year's electronicaUSA with the Embedded Systems Conference in San Francisco last month were likely to find news of finished goods, such as development kits and debugging gear, more useful than that of the latest electronic components and ferrous materials.

Macraigor's usbDemon converts JTAG commands to popular target signals.

Applied Data Systems Inc. demonstrated the Graphic ClientX, an XScale-based successor to its flagship Graphics Client Plus single-board computer development platform intended for fleet management, kiosks, point of sale, medical, security and industrial applications. Also measuring 4 x 6 inches and billed as a drop-in replacement, the new board boasts an Intel 400MHz PXA255 processor with improved power management, Fast Ethernet, stereo sound and an advanced CAN bus controller. The unit is scheduled to begin shipping in volume in June; volume-based pricing starts at US$390.



Applied's VGX is aimed at development of head-up media displays.

Applied also introduced VGX, an XScale multimedia board that it says is designed for development of head-up displays common in the military and aerospace industries. The 4 x 7-inch board includes a Silicon Motion SM501 graphics accelerator that supports 24-bit color displays up to 1,280 x 1,024 pixels, dual display capabilities with a CRT/TV encoder, and NTSC/PAL video input with scaling. For fleet management and telematics applications, the 400MHz PXA255-equipped board reportedly has been validated for industrial temperature, EMI, shock and vibration, and includes a wide array of I/O and peripherals, including dual CAN bus controllers. Volume-based pricing starts at $460; volume shipments are set for July.

Based near Munich, Germany, **Kontron AG** demonstrated X-board Mini COM, a credit-card-sized version of its XScale-based computer on-module boards that the company says are designed for low-power mobile devices, such as portable instrumentation or for adding intelligence into larger systems.

Similar to single-board computers, computer-on-module (COM) boards contain the processor and all controlling logic for memory and peripherals, but lack the connectors, which are implemented on a so-called base board, to which the COM board connects.

According to Bruce Boyer, Kontron's vice president of marketing for North America, this configuration gives COM boards an advantage over SBCs, which might drag along features not required for the application. "When you can create your own base board with exactly what you need, you get a custom solution without having to create the processing engine," he said, which also removes some of the complexity.

COMs also benefit developers who are unable to find off-the-shelf-boards with the right peripherals, or who are required to develop their own. The X-board Mini COM is priced at US$250; volume shipments are scheduled to begin at the end of this month.

On-chip debugging tools maker **Macraigor Systems LLC** unveiled usbDemon, a device for JTAG debugging that operates over the Universal Serial Bus. According to the company, the tool works with GNU and most other debuggers and converts JTAG commands from a Windows host to the corresponding signals required by the target, which can include AMD, ARM, ColdFire, PowerPC, MIPS and XScale processors.

Available now, usbDemon costs US$750. ▮

Beach Brings Watermark to EASI-Studio

BY EDWARD J. CORREIA

EDA tools developer Beach Solutions Ltd. in mid-April updated its EASI-Studio IP packaging and interface design environment with a code validation mechanism it says will prevent duplication of effort among developers looking for up-to-date code and keep everyone working on consistent versions of their circuit designs.

In addition to the watermarking feature, enhancements in EASI-Studio 3.2, which creates so-called Embedded Applications System Interfaces (EASI), include a memory map editor that reportedly configures register address positions using a drag-and-drop interface. The tool includes code generators for C, C++, VHDL, Verilog, SystemVerilog extensions, and the E high-level verification language.

If those generators are inadequate, Beach in February launched EASI Developer Suite, a group of tools that permit developers to customize the generators that come with EASI-Studio or build new ones based on their own specific design requirements. Included are tools to compile, test, debug and document the generators for distribution to teams using EASI-Studio. ▮

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ESC SOFTWARE

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building applications for systems with memory management units to enclose their applications and threads inside memory partitions, thereby protecting them and the operating system from crashes caused by malfunctioning code.

The company claims its so-called Embedded Memory Protection is a more simple approach than competitors' method of employing virtual memory and process-model protection schemes because of its single address space, under which logical memory is mapped page by page to physical memory without affecting compatibility with existing code.

Embedded system emulation tools maker **DoubleWide Software Inc.** unveiled a new version of DoubleWide Designer, a graphical test tool that allows developers using its DoubleWide Studio to test complex configurations. DoubleWide Studio is a drag-and-drop environment for creating virtual target systems running Linux, VxWorks or any RTOS with available source code. The Designer component enables developers to create and configure test scenarios involving multiple interconnected virtual systems such as Web and FTP servers, switches and routers.

Aonix North America Inc. released an Ada95-specific edition of SmartKernel, its real-time kernel for safety and security-protected systems. The kernel is the first in a series of language-specific kernels that the company says will enable embedded systems to run applications written in multiple languages safely on a single board. Editions for Ada85, C/C++ and Java also are planned. Pricing starts at US$15,000 and includes an IDE, the capability to download and debug over Ethernet or serial, and a code coverage analysis tool. ▮

M-Business Anywhere Targets Desktops

iAnywhere's Palm, Pocket PC applications also now can run on Windows

BY EDWARD J. CORREIA

Current licensees of iAnywhere Solutions Inc.'s M-Business Anywhere mobile platform can upgrade to version 5.5, released in mid-April, and deploy their Palm OS and Pocket PC applications unchanged to desktops, laptops and tablet PCs running Windows, the company said.

Diana Ungersma, senior product manager at the Sybase Inc. subsidiary, said the change was prompted by customer demand for deployment to multiple device types. "In the past, that usually meant Palm and Pocket PC devices," she said.

Ungersma said the company had been getting requests from developers, particularly in government, looking to deploy their M-Business applications to Microsoft's relatively new Windows XP Tablet and other Windows-based machines. "If you think about a company trying to mobilize Siebel, [clients] are using it at their desk and maybe on a Pocket PC device. Now some people want offline access on their laptops when they are not connected to the network."

Once the M-Business server has been upgraded, Ungersma claimed that applications should run unchanged. "The HTML, JavaScripts and data should work on the tablet, but depending on how the HTML was written, developers might want to [reformat the interface] to take advantage of increases in screen size."

IMPROVED TRACKING

The new middleware also includes improvements in application usage tracking and reporting. "Once you've deployed an application, the company wants to know who's using it, how often they are syncing, how many people are having errors, and what's installed on the hardware," the latter of which she said also can help with asset management. "It's much harder to manage a remote device than a desktop computer, and yet it's becoming more critical to application deployment."

It also gives developers specifics on adoption of an application. "They can tell whether folks are using it or not, and that makes the justification for a project easier to argue," Ungersma said. The software also tracks whether the device is connecting wirelessly or through a cradle. "That allows a developer to [know] at sync time whether to send less information if it's a wireless connection."

M-Business Anywhere 5.5 is available now for Windows servers; Linux and Solaris versions were set for release in late April. The upgrade is free to existing licensees and can be downloaded at www.ianywhere.com/mbusiness_upgrade. Deployment license pricing starts at US$299 per mobile user. iAnywhere also offers a $69-per-user Web Edition, which displays static Web content on mobile devices with no integration with the company's SQL products. ■

"We've changed the economics of integration; it's as simple and as complex as that." Complex because we challenged the very notion of integration. We felt true integration should connect everything, internally and externally, from business units to suppliers to partners to customers, everything. But to achieve this, someone had to develop a new architecture. So we did. The world's first Enterprise Services Bus, Sonic ESB™. It combines standards-based messaging, Web services, XML transformation and intelligent routing to coordinate the secure interaction of applications across your extended enterprise. It connects existing IT assets with tomorrow's ready-to-integrate applications, is nimble enough to change as your business does, and is rock solid. This allows you to integrate incrementally. To start where it's most needed and grow as required without costly obstacles. And that changes the economics of integration. Simple.

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Sizing Up the Stacks

When choosing a J2EE platform, infrastructure and support play a big role, analysts say

BY YVONNE L. LEE

Developers who want to build and manage the deployment of J2EE applications are both blessed and cursed with choice.

They are blessed in that there are several vendors' integrated suites from which to choose, including components ranging from operating systems to J2EE application servers, databases to portals, and integration engines to software development tools.

They can choose software stacks from market leaders BEA Systems Inc., IBM Corp. or Oracle Corp., and other offerings from Borland Software Corp., Novell Inc. or Sun Microsystems Inc. In addition, they can choose to "roll their own" with the open-source stack that is Linux, Apache, MySQL, Perl or PHP, and Secure Sockets Layer, also known as the LAMPS stack.

This plethora of choice also can be a curse because one vendor's bundle may not have the same components as another's, and because even where components have similar names, the functionality may be different.

Nevertheless, several core components are common to what Forrester Research Inc., of Cambridge, Mass., refers to as an "application framework." Key ingredients are the operating system, application server, a database, a Java Virtual Machine (JVM) that runs within the application server, and a programming environment, often but not necessarily an integrated development environment. BEA and IBM use their own JVM. Other companies use the Sun JVM.

On top of this, vendors have placed their own portal servers, security and integration services.

The decision as to which vendor's software to use often has very little to do with the technical issues of the individual parts, such as the application server or database, said Forrester analyst Ted Schadler, but rather with what the complete solution looks like, or which vendor a customer wants to do business with.

"To a significant degree, the application server itself has been commoditized, and [the value] is not the individual pieces, but a sum of the parts," said Dana Gardner, analyst with The Yankee Group, based in Boston. "How does this system work in total? Do I get a full integration and development benefit? How much greater is the whole than the sum of the parts?"

A MATTER OF CHOICE

Here's how the J2EE platform offerings from a sampling of vendors stack up:

	BEA	Borland	IBM	LAMPS	Novell	Oracle	Sun
OPERATING SYSTEM	Linux, various Unix, OpenVMS, Windows	Linux, Solaris, Windows	Linux, various Unix, mainframe, Windows	Linux	Linux, NetWare	HP-UX, Linux, Mac OS X, Solaris, Windows	Linux, Solaris, Windows
APPLICATION SERVER	WebLogic Server	Borland Enterprise Server	WebSphere Application Server	Apache	Extend Application Server	Oracle Application Server	Sun Java Enterprise System Application Server
DATABASE			DB2	MySQL		Oracle	
IDE	WebLogic Workshop	JBuilder	WebSphere Studio	Eclipse	Extend Composer	JDeveloper	Sun ONE Studio Creator
JAVA VIRTUAL MACHINE	WebLogic JRockit	Sun JVM	IBM JVM	Sun JVM	Sun JVM	Sun JVM	Sun JVM
SECURITY	WebLogic Enterprise Security		WebSphere Application Security, Tivoli Access Manager			Identity Management	Sun Java Enterprise System Identity Server
PORTAL SERVER	WebLogic Portal Server		WebSphere Portal			9iAS Portal Server	Sun Java Enterprise System Portal Server

Three years ago, the decision might have rested on who had the best application server, said Mark Driver, vice president and research analyst at Gartner Inc.'s Minneapolis office. "There's not a dramatic difference between the individual performance metrics," he said. "You end up with a situation where you go from the best of each piece to a set of 'good enough' of the whole and picking from that. Sometimes, it comes down to long-term relationships.

"The problem with the best-of-breed approach is we find out that while it looks good in theory, it is extremely expensive—far too expensive than to be accessible to the mainstream," Driver continued. "Instead, I would go to a large vendor that I trust and determine which of the pieces you need the most, above and beyond the commoditized core."

So, the decision process consists of three steps: examining the existing infrastructure, working with trusted relationships, and then looking at the overall package of components, he said.

With hardware, the choices are often simple: If you're a mainframe shop, you're likely to gravitate toward IBM. If you're heavily invested in Solaris or Sun hardware, you may choose to stick with that vendor. But in addition to considering hardware, organizations must consider which applications they are already running to make sure they will not conflict, said Clay Ryder, an analyst with The Sageza Group Inc.

"If you do something that's incompatible with what you have, that's going to be expensive because you have to remove what you have," he said. "In the old days, they called that vendor lock-in. Past vendor choices will limit future vendor choices, which can be construed as another vendor lock-in." If a major application runs only on a certain operating system or with a specific database, it doesn't make sense to use a J2EE application platform that runs on a different operating system, he said.

Analyzing an organization's resources means not only looking at hardware and software, but also at human resources, said Yankee's Gardner. "You've also got to look at your skill set," he said. "It's hard to find good developers. It's unlikely that somebody will just kick everybody out and put up a for-hire sign."

IT'S ALL ABOUT RELATIONSHIPS

After taking an inventory of the organization's resources, a group should next look at its external relationships, said Forrester's Schadler. "You get into a lot of relationships," he said. "You're making a decision based on a corporate standard, as opposed to a decision based on a piece of software."

Bola Rotibi, senior analyst at London-based Ovum Ltd., said, "The next bit is: 'Whom do I trust? How well do they

▸ continued on page 30

THE STACKS

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understand what I want as a business? How open standards are they?' I'm not saying open source," she said. Looking at how well a package fits in with established standards not only helps tie applications in with existing applications, but also assures that a solution will work with future products, even if a company goes out of business, she said.

In addition, choosing a vendor means getting access to that vendor's support structure, she said. This is particularly important when choosing between a commercial vendor and an open-source solution.

"If you're using open source, apart from the part that they're free, getting open source requires some technical expertise. Some things you may have to recompile, and you have to do a lot of your own work," Rotibi said. "It's not always that simple. You kind of have to know what you're doing or go and get some help. What you're getting from the more commercial side, you're kind of buying into their support structure." She described IBM as having the "Rolls Royce" of support services.

"The build-your-own model is really attractive to a certain class of developers," said Gartner's Driver. "Traditionally, it's been developers who have been early adopters, people who are willing to be their own systems integrators because you have to do a lot on your own. As open source is being leveraged by the world's largest companies, that isn't written in stone. Because of the peer-based support mechanisms, we have tended to see open source [only] in the early adopters."

GOT MAINFRAME?

Selecting an application platform should start with looking at the servers and software you already own, analysts said—and a big question is: Are mainframes part of the mix?

If they are, the winnowing process may end here, some said.

"If you've come from a mainframe environment, the beauty of IBM is chances are you already have some sort of support and sales relationship in place," said Bola Rotibi, senior analyst at Ovum Ltd. "You want to make the migration path a little bit smoother. Someone like that is more likely to have those sort of tools for your infrastructure."

Mark Driver, vice president and research analyst for Gartner Inc., said, "A number of vendors have Java on the mainframe, but the only one that's taken seriously is IBM. I believe BEA has one. I believe Fujitsu does. But nine times out of 10, you're going to pick IBM."

Clay Ryder, an analyst with The Sageza Group Inc., went so far as to say that most of the decision will be made according to what kind of hardware an organization already has in place. "Choices are either going to be driven by the customer or their hardware supplier. If you buy the solution from IBM, [the choice of development platform is] going to be very simple. That's going to largely be driven by IBM's consulting."

In addition, he said, organizations that buy from systems integrators will probably buy the tools supported by those integrators. *—Yvonne L. Lee*

THE WHOLE PACKAGE

After evaluating existing corporate infrastructure and relationships, an organization should then look at the packages as a whole, the analysts said.

"You sometimes find people making the choice that's too narrow a decision," said Mike Gilpin, Forrester's vice president and director of research. Such narrow criteria include "This one's easier to develop with," he said.

Wayne Kernochan, president of Infostructure Associates, of Wellesley, Mass., concurred. "It's not necessarily about which is best for the job, but it's often about what general type of development tool sets the organization thinks is going to be the corporate standard."

In this area, the analysts gave an edge to market leaders BEA and IBM.

"Companies that are looking for cutting-edge development deployment and integration capability might look to a BEA," said Yankee's Gardner. "If they're an organization that has business-to-business activities and heterogeneity, they might look to an IBM."

"IBM is probably the strongest across the board, which is clearly evident by their growth in this area," said Gartner's Driver. "WebSphere wasn't strong in the beginning. IBM got good enough this year, and [WebSphere] surpassed BEA as the world's largest app server. IBM Global Services is probably why. They can come in with a ton of services."

Infostructure Associates' Kernochan said, "When you have a pretty large-scale Java application that's fairly complex, IBM does a fairly good job of making it as least complex as possible. Rational has been the standard in design. It can be a way of cutting down complexity. They've done a reasonable job of integrating it with WebSphere Application Developer."

Forrester's Gilpin said, "In the area of development tools, it's really BEA that has the advantage right now. It's best for applications that are using JavaServer Pages and have fairly conventional J2EE processing on the back end."

BEA's tuning of its JVM, called JRockit, and its rapid adoption of new standards in its application server make it particularly attractive for organizations that want to introduce applications that are in the forefront, said Ovum's Rotibi.

"BEA [is] coming from a position of trying to make traction in the industry," she said. "You look at the demographics. Oracle has its database. It's database country. You've got IBM—that's hardware and Global Services. You look at Microsoft—it has the operating system. BEA, OK, it's got Tuxedo [a transaction platform], and it's got the application server. A lot of the application server is getting commoditized. They have to raise their game, and one of the ways is talking [about] the standards."

CONSULTING THE ORACLE

A late-surging dark horse is Oracle, according to several analysts.

"We see Oracle getting much more traction," said Forrester's Gilpin. "Oracle has a lot of customers, and they have made it very attractive for them to use their [J2EE platform]. They're trying to keep those customers in the fold as opposed to letting them go elsewhere. Most of those would have gone to BEA. It was much more likely a couple of years ago that if you were an Oracle customer, you would be using BEA."

Oracle has made it particularly helpful for customers of its own database—but not customers of other databases—to use the JDeveloper application server and tools stack, said Yankee's Gardner.

"Oracle [has] created a bevy of tools that are often called wizards that tie together the database with business applications and eases the deployment of these with a set of automated tools. You look at Sun and BEA—they don't have business applications. Oracle does. IBM in some cases does. They're trying to put a whole that's greater than the sum of the parts," he said.

These wizards and business applications are particularly useful for organizations that work with a lot of data and are trying to create applications based on fast transactions, Gardner added.

Although Borland doesn't have particularly strong market penetration, it has a strong following among those who need legacy integration because of that company's CORBA technology, he said.

One company that did not get much credit from the analysts is Sun. "Sun is not a strong player in the development tools space," said Forrester's Gilpin. "They've made a number of attempts. The NetBeans initiative has been moderately successful. [But] the tools that have been built on NetBeans are not as good as those based on other architectures. The area of integration [also] is a weak area for Sun."

According to Gartner's Driver, "They were a vendor largely perceived to [have only] a hardware strategy. When they sell software, they still look to see how many servers they can sell."

Sun's Java Studio can be a good option for organizations that already have Solaris, said Yankee's Gardner.

"With Sun, its [strength has] been a building of Java that's tightly coupled with their operating system," he said. "They have strength in the Unix shop." ▮

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EDITORIAL

Microsoft Wins The Java Wars

As the result of an April peace settlement, the long-standing war between Microsoft Corp. and Sun Microsystems Inc. may be coming to an end. The sudden détente between the two companies was unexpected, but the long-term results aren't hard to predict.

The settlement ended ongoing lawsuits in which Sun had charged Microsoft with violating its Java licensing terms and for general anticompetitive behavior. Now, the newly found best buddies are exchanging jerseys instead of insults, and Sun gets to deposit a much-needed US$2 billion in its bank account.

Microsoft is buying a lot for that $2 billion, and is the clear beneficiary of this bilateral arrangement.

Here's how Microsoft benefits:

The settlement should play well in both Washington and Brussels, where the tech giant continues to face antitrust challenges; making nice with its most vocal opponent may particularly influence the European Union lawmakers. Sun also agreed not to sue Microsoft over future intellectual property issues, taking one potential weapon out of its competitive arsenal.

Microsoft has agreed to continue supporting its obsolete Java Virtual Machine, a move that appears to benefit Sun, but that actually continues to cripple that technology's users with a substandard implementation.

Sun has agreed to seek Windows certification for its *x*86-based servers. This not only provides more outlets for Microsoft to sell Windows, but also blunts Sun's anti-Windows rhetoric.

Sun also has agreed to license Microsoft's Windows communications protocols; if it bakes stronger support for Windows into its Solaris stack, server software and desktop applications, it will again serve to reinforce, rather than challenge, Microsoft's domination on the desktop.

How does Sun benefit? Well, it gets cash. It can cut back its legal expenses. Microsoft has promised not to sue Sun for IP violations—something that was unlikely to happen. The companies have agreed to collaborate for a decade on interoperability, which benefits Sun's customers more than it benefit's Microsoft's customers.

It certainly looks like Microsoft holds all the cards. But as Sun's financial position continues to decline, Scott McNealy and the newly promoted president Jonathan Schwartz needed a way to get beyond the endless Microsoft bashing. The influx of Microsoft billions into the Sun coffers was undoubtedly a key factor as well.

Long term, it's unlikely that the settlement will have any effect whatsoever on Microsoft's products, technology or marketing, beyond its continued support for its Java 1.1.4 virtual machine and some minor interoperability tweaks.

For Sun, the settlements will make the company's hardware and software more compatible with Windows, which may help the firm survive in an increasingly Microsoft-dominated world—and Microsoft, in order to demonstrate that it's not an abusive monopoly, needs Sun and Java to survive on the server, just as it needs Apple and Mac OS X to survive on the desktop.

Now that Sun is on Microsoft-sponsored life support, it's clear which company really won the Java Wars. ▮

GUEST VIEW

WHEN ROI IS OVERKILL

Return on investment (ROI), risk analysis, requirements analysis, alignment with strategic objectives—it's a given that these methodologies should be used for judging the merits of a software investment.

So, why do our hearts sink at the prospect of doing these analyses? The answer is simple: They don't work. Oh, they might be fine for big-ticket enterprisewide software, but for lower-cost software these heavyweight techniques don't work for several reasons.

One is that predicting the value of an uncertain asset over time is counterproductive when it can more easily and accurately be demonstrated in a trial.

Another is that analysis processes often introduce "paralysis by analysis" into organizations; people are unwilling to invest time and effort into getting something approved. In many cases, the ROI predictions are often incorrect due to errors in assumptions or calculations. Also, a predictive approach encourages bloatware, with large unnecessary feature sets satisfying a requirements analysis but not necessarily benefiting users.

Imagine you've used a product intensively for two weeks and found that it meets all of your requirements at a reasonable cost. It would be pretty galling then to be told by some manager to try out three similar products, write a report and make a presentation to top managers.

An evaluation is a far more productive use of resources than a prediction, which often relies on false or exaggerated claims from the vendor. The best way to determine a technology's potential and value is to put it to the test in your environment.

Paralysis by analysis. The company I work for sells software tools for software developers, DBAs and application testers. The people interested in our products are intelligent, highly trained and generally well paid. They work on projects that involve spending hundreds of thousands, often millions, of dollars. You would think that they'd have little difficulty justifying the purchase of inexpensive tools.

Wrong. Often developers, DBAs and testers can order software only after they jump through lots of time-consuming hoops to justify the purchase to management. Not surprisingly, some don't bother going through the laborious requisition and evaluation process, despite really needing the tool; the process is just too painful. I pity the folks working in government departments and large multinationals, who often tell us that they need the tool right away but can't get it approved for another three months.

SIMON GALBRAITH

ROI calculations are normally wrong. The sad truth is that the extensive ROI calculations favored by many organizations almost always contain fundamental mathematical flaws. I used to do such calculations for Shell, and I confess to being guilty of a few howlers myself.

Moreover, the assumptions that are required for an ROI determination are more often guessed than measured: "How many person-years will a better bug-tracking system save in the next three years?" No organization can make such a prediction with any certainty.

You get what you measure. Any predictive approach focuses on product characteristics that someone judges as providing underlying value. The natural path is to buy a product that lists the most features. This leads to bloated, overpriced software solutions that claim to do a lot of things, but don't do anything well enough to justify their cost. Generally, the more features and tick lists a product satisfies, the harder it is to use and the more difficult it is to support.

Years ago, a month after I started my first proper job, I attended one of those "management meets the new employees" lunches. I was seated next to the CTO, who asked me, "So what could we do that would make your lives easier?"

Without really thinking much about it I said, "Why don't you just let us spend the money that is needed for our projects without lots of hoops and other justifications?" There was a ripple of uncomfortable laughter around the table: "How ridiculous! We couldn't let people do that." Aside from that gentle, slightly horrified rebuff, no proper response was given on that occasion.

Since then, I've heard these explanations when I've posed the same question: "There would be no control over cash flow." "Spending would not be aligned with corporate strategy." "Fiscal chaos would ensue."

Yeah, right! Even low-level IT employees make US$50,000 per year, and yet giving them a budget to spend up to $2,000 a year on choosing the right software for their jobs is going to cause chaos and cash-flow problems?

The real issue is enforcing management authority. That might make sense for enterprise decisions, but not for a software tool that costs a couple hundred dollars. If $2,000 worth of tools might make them 10 percent more productive or efficient, or improve the quality of their work, isn't that a good investment? In many cases, the answer is "no."

If you think I'm just being cynical or naive, then ask yourself this: How often has anyone gone back and analyzed the actual ROI of small software purchases? When it comes to anything but very expensive enterprisewide software, management requires that you follow corporate protocol for justifying a purchase, but doesn't see the need to verify the value of that purchase after it has had some time to prove itself. If the concern really were ROI or husbanding organizational resources, there would be as many post-mortems as there are prepurchase analyses.

The drawn-out process of proving value before implementation is the wrong approach when considering small software purchases. Allowing low-priced tools to prove themselves after they've been tried and then purchased would empower employees to make small decisions that will benefit the wider organization. This reduces paralysis and allows organizations to refocus on core activities rather than expensive guessing games that only demoralize an organization's most vital asset: its people. ▮

Simon Galbraith is marketing director for Cambridge, U.K.-based Red Gate Software Ltd., which sells database, load-testing and debugging tools.

MISSED OPPORTUNITIES

Editor's note: Beginning this issue, Allen Holub joins SD Times as our Java Watch columnist. A leading architect, consultant and instructor in C/C++ and Java, he has written eight books, including "Taming Java Threads" (Apress).

Java's "Tiger" release (version 1.5) is due out later this year. I'll have many things to say about the changes that Sun has made to the language, but in this column, I want to address some of the downside. Just to head off the flames, bear in mind as you read this column, that I *like* Java. I program in it almost exclusively and think that it's a great language for what it does. I am not the enemy.

Sun, however, blows it on occasion, and it seems reasonable to discuss the downside as well as the upside. I don't intend to trash 1.5 so much as to give you a heads-up so that you can be thinking about how you might want to use (or not use) some of the new functionality.

The new Tiger release is noteworthy in that it introduces significant features to the language itself. Some of these features (among them, enums, a new "foreach" form of the for statement, and a set of concurrency utilities to help you get multithreaded applications under control) are long overdue. Other features (static imports) are hideously bad ideas. The largest addition to the language is generics: a C++-template-like addition to Java.

I can't possibly talk about all the new stuff in a single column, so I'll discuss the new pros and cons of these features gradually, over the course of several issues. Another resource is the article "J2SE in a Nutshell," found at java.sun.com/developer/technicalArticles/releases/j2se15.

JAVA WATCH

ALLEN HOLUB

Before talking about Tiger, however, let's talk about politics. Several of the new features in Java 1.5 are there because Microsoft has added similar features to its C# language. I really hate the idea of a compiler-level arms race. Language features should be added because they improve the language, not because the other guy does it.

Take autoboxing (please). With autoboxing, if you use a primitive-type object (like a double) in an object-like context (like a Collection insert), the compiler creates an object wrapper (like a Double), initializes it from the primitive, and uses the resulting object. Autoboxing is in Java because Microsoft put it in C#. Unfortunately, autoboxing is far from the best solution to the problem of primitive types being treated inconsistently; it would be vastly better to make the primitives honest-to-god classes.

For example, if double were a real class, you could insert it into a Collection without fuss. So, you'd find a cosine by saying x.cos() rather than Math.cos(x). Therefore, you'd be able to derive classes from double to add operations, and so on.

There's absolutely no reason why Java's primitive types could not be real classes. The argument that it's more "efficient" to have two categories of types is specious—the compiler can optimize primitive-as-object operations down to essentially the same code as it creates now.

It is certainly easier for the compiler writer if primitives are segregated from the main typing system, but I don't think that the convenience of the compiler writer is a valid reason for adding a significant inconsistency to the language. If an int were an instance of a genuine built-in class, then autoboxing would be completely unnecessary.

My gripe, then, is that Sun didn't take the opportunity to really fix the primitive-type problem. Instead, it just aped the boys in Redmond and introduced a poorly thought-out feature to the language.

Another example of a missed opportunity is in Tiger's concurrency utilities. These classes make it easier to write multithreaded programs by providing a set of Posix-like threading-support classes. Don't get me wrong—having these classes is a giant leap forward. The real problem, however, is that threading itself is poorly understood and easy to get wrong, and the new classes don't help at all in solving this fundamental problem.

The core difficulty is that threading, as implemented in Java, is fundamentally procedural in nature (you synchronize procedures, not objects), and this procedural worldview clashes with the object-oriented paradigm. (I hate that word, but can't think of a better one.) That is, an object-oriented programmer wants to think about asynchronous messages, not about threads.

Some languages (Ada, PL/M, etc.) solve this problem elegantly by directly supporting asynchronous messages in the language itself. To my mind, Java should have solved the threading problem in the same way: by introducing language-level support for asynchronous messages.

I'm disappointed that Sun didn't take the opportunity offered by a major release of Java to really fix a few serious flaws in the language. I don't like the Band-Aid solutions that it has actually used. Whether Sun's failure was caused by timidity, lack of imagination or internal politics is immaterial. Tiger represents a missed opportunity, and that's a pity. ■

LETTERS TO THE EDITOR

UP IN FLAMES

In his column ["The Next Challenge for Open Source," March 15, page 29, or at www.sdtimes.com/cols/integrationwatch_098.htm], Andrew Binstock shows he is typical of the lazy writers rushing to the press nowadays.

What does "recent flameout" mean in terms of describing Sybase? Sybase has turned around in five years. My dictionary defines recent as "a time immediately prior to the present." So would that be five years ago? Come off it, Mr. Binstock. As for "flameout," the only one in danger of getting burned is Mr. Binstock. In all fairness, when will writers such as Mr. Binstock stop using tired, ill-informed, lazy descriptions that have no bearing on today?

Chris Forsyth
Executive Editor
Sybase Magazine

Andrew Binstock responds: I am happy to explain my choice of words. Let's start with "flameout": While Sybase is profitable at last, it's only so on the basis of having drastically cut costs. Sales continue to drop. In fact, FY2003 showed Sybase's revenue at its lowest level in 10 years, and significantly lower than the previous year. It is a flameout, and since it continues to worsen year over year, "recent" does not seem to be wholly unsupported.

But "recent" refers more pointedly to Sybase's drastic drop in relevance. For a few years, the company had a chance to reclaim mind share with its EAServer, but never figured out how to compete in the app-server market. Outside of some traditional vertical niches where it still sells its DBMS, the company's greatest mind share comes from its iAnywhere product—an embedded database that it bought from Watcom.

GET ME REWRITE

Andrew Binstock's column ["ISVs Should Not Rewrite Code," Oct. 1, 2003, page 37, or at www.sdtimes.com/cols/integrationwatch_087.htm] discusses failures that have arisen when companies have undertaken complete rewrites of their products. While he mentioned the rise and fall of Ashton-Tate, I would like to point out that there were two successful rewrites of its dBase product: dBase II to dBASE III (compiled code to C, more work areas, etc.) and dbase III to dBase III Plus (user interface for designers a la Borland's Paradox database).

This propelled marketing to do a third. They wanted everything: a SQL interface, better user interfaces, a compiler/linker, etc. There was a mismatch between what the programmers could do and what the marketers wanted. The programmers wanted a smaller incremental release that Jeb Long and myself named BOOH (Bat Out of Hell).

Joel Spolsky is correct in that sometimes programmers don't like "messy" code put into production. I might see this at Microsoft: all the "perfect" and bright/very bright gen Xers. But this phenomenon is now; we are talking about 20 years ago. Then we were just starting to scratch the sand.

Bill Bates
Senior SW Design
CH Robinson

CORRECTION

An April 15 story on Embarcadero Technologies Inc. indicated that an Embarcadero customer uses 15 people to manage 700 databases. That company is a prospective customer of Embarcadero's.

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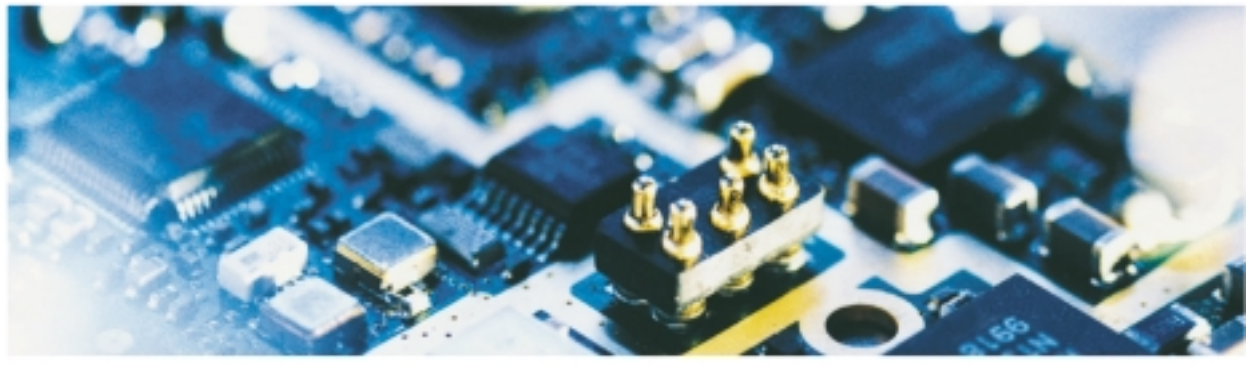

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NOT SO EXTREME PROGRAMMING

After several years of jubilant promotion, Extreme Programming (XP) settled into its anticipated role as an alternative methodology for developing software. Now, several years later, IT sites and ISVs have had a chance to assess the approaches espoused by XP and see just how much value they bring to the problem of software quality and timeliness. The results are not encouraging.

First of all, on an adoption basis, XP could hardly be termed a success. IT sites today, as a rule, do not use XP. The closest they come is acceptance of automated testing and limited test-driven development (TDD). Both of these practices are tenets of XP, even though they antedate XP.

However, the full XP is based on 12 practices. The other practice IT sites use extensively today is coding standards. Beyond testing and coding standards, XP is not widely deployed. Advocates of XP attribute this to "fear" by hidebound departments that are unwilling to try new techniques (which is true). However, even small sites and start-ups show no great uptake of XP. Nor is XP evident in open-source projects, even small ones where it would be a good fit.

Second, XP was embarrassed by the cancellation of the C3 project at Chrysler. This project was the poster child for XP. It was begun in 1996 with the mission of getting Chrysler's payroll off its mainframes in time for Y2K. Kent Beck, the father of XP, was brought in, and he implemented XP and made the project a showcase of the new methodology.

Alas, Chrysler cancelled C3 in February 2000: The deadline had been missed, and the old mainframes were still cranking at full tilt to handle Chrysler's payroll. With Beck running the show, there is no wiggle room for asserting that XP wasn't done correctly.

INTEGRATION WATCH

ANDREW BINSTOCK

While C3 is a terrible black eye, it has not been a telling one. I had hoped to see a revision to XP, which, based in part on real-world failures such as the C3 project, would fix and tweak the things that don't work well but whose shortcomings were hard to see when XP was first formulated. This would be a mature step that would greatly bolster my confidence in XP.

In counterpoint, UML, the design language that is anathema to XP principles, has regularly been revised. And as a result, it is gaining ground at IT sites. There are more tools today for doing UML than ever before. Drawing and mapping business processes is increasingly a standard part of software development at IT sites—proving that these sites are perhaps not as inflexible as XP aficionados might have us believe.

With a stillborn poster child, so-so acceptance in mainstream IT, and seeing solid growth in antithetical technologies, XP appears to be on the defensive. A new book from Apress titled "Extreme Programming Refactored: The Case Against XP" compounds XP's problem by analyzing shortcomings of the XP approach. The book is uncomfortably goofy at times, but it makes some compelling points about what does not work in XP. TDD is the one practice that comes out well, which indeed it deserves.

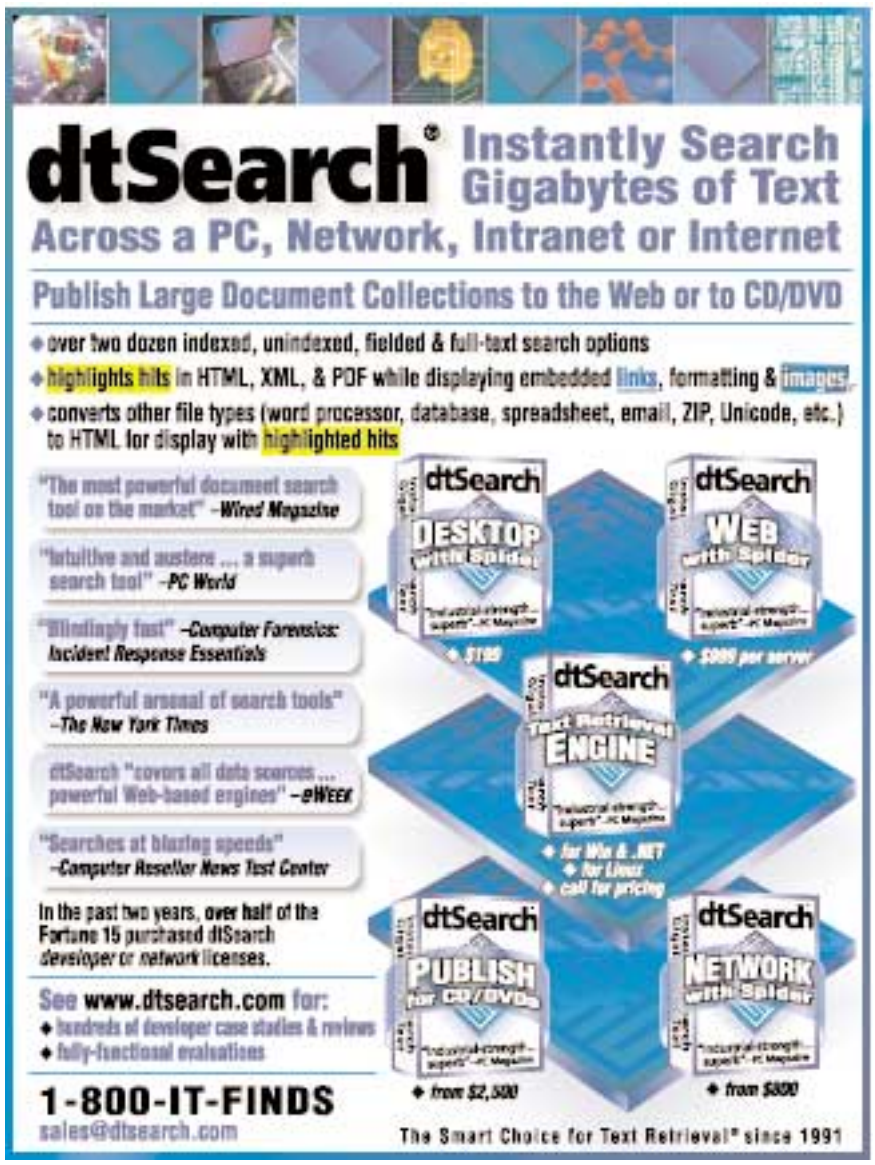
The foundation of XP, in my view, is part of the problem: It is a radical embrace of an approach that goes from the particular to the universal. It is the purest form of bottom-up development: You never design more than what is immediately needed, you write the least amount of code that will fulfill your next test, and you design the test to provide the least amount of incremental change. After you've written lots of tests (frequently thousands), you clean up your code by using one of 72 refactorings—which are specifically analyzed techniques for cleaning code without changing its functionality.

The fundamental problem with this approach is that software today is complex and large, so it cannot be designed properly by using the least-increment approach and hoping that a sound product will eventuate through the organic accretion of lots of small design decisions (followed up by code cleaning).

Large, complex projects have to be designed top-down and the code must be developed to that design—regardless of its complexity. XP projects are particularly susceptible to the gap that exists between a project under development and one being deployed. Some projects cannot be fully tested except at deployment, at which point it is too late to perform hundreds of small revisions because of a predilection for a specific coding approach.

An interesting question is: Could XP-based software development have put a man on the moon? I believe the answer is no. XP aficionados might contend it was not developed with that kind of project in mind. And I would agree. Unfortunately, most big IT projects look more like putting a man on the moon than they look like XP's showcase code exercises of simple designs whose code can be revved in infinite, small increments. ▮

Andrew Binstock is the principal analyst at Pacific Data Works LLC.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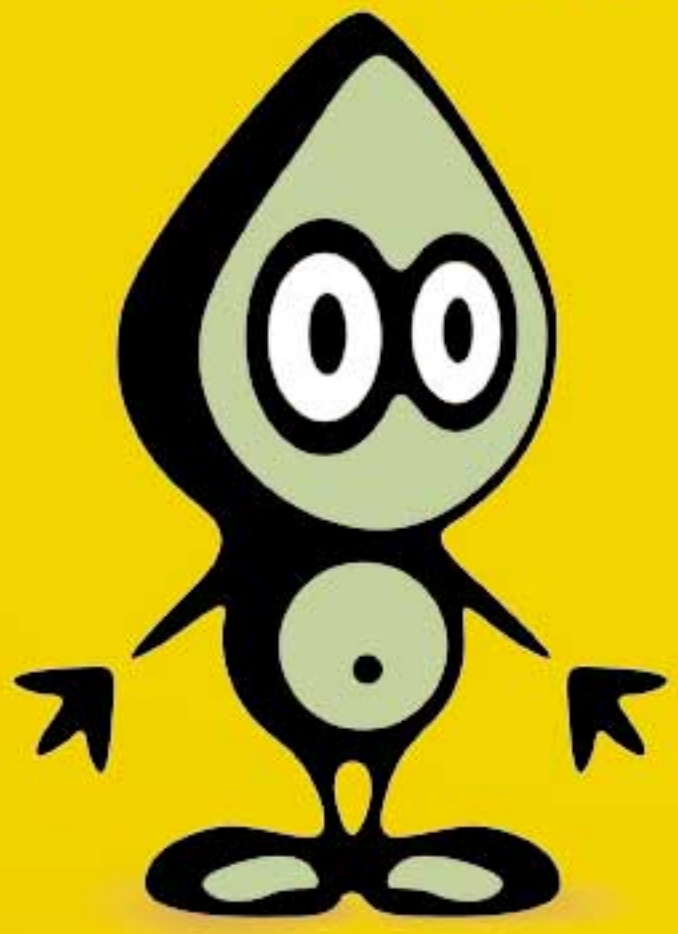

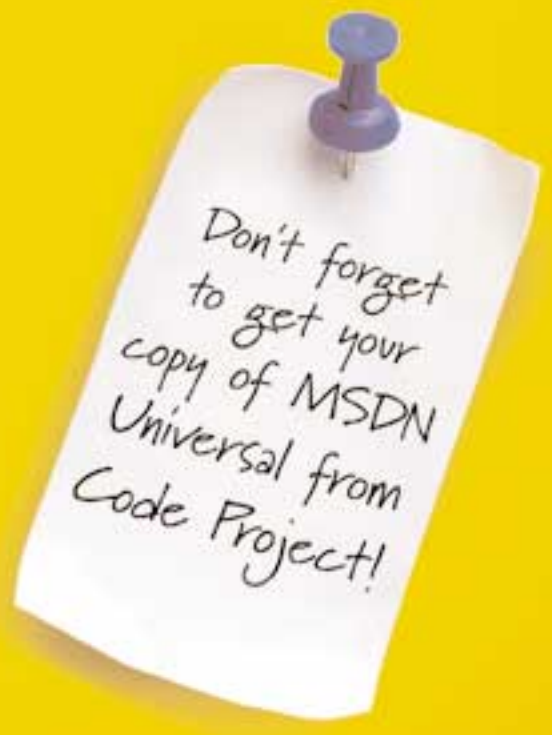

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DISGRACE UNDER PRESSURE

In my 692nd hour of scuba diving, my life was threatened by a computer malfunction. One minute I was admiring the ghostly beauty of Monterey's plumose anemones (*Metridium senile*), the next I was looking at my dive computer and thinking, "That's not a correct reading," and the next I was staring at the grayness that only a dead LCD can achieve.

This was my first dive using an "air-integrated" computer, which not only performs the "classic" dive computer task of tracking exposure to "the bends," but also additionally replaces the analog gauges traditionally used to track depth and air pressure. When my computer went blank, I was left with no instruments to help me determine the one thing that really matters when you're underwater: how long you have to safely return to the surface.

Since I had been keeping a close eye on my new computer as I familiarized myself with it, even after it died I knew that I was approximately 50 feet underwater and had more than half a tank of air left.

Not coincidentally, my dive buddy and I were diving a very conservative profile and paying particular attention to maintaining visual contact, as both of us were using new gear. So I gave the signal for an equipment failure (it involves the middle finger), called off the dive, and went for a long surface swim back to the shore. Because the other circumstances of the dive were of low risk and my buddy and I followed an "anyone can call the dive at any time" safety protocol, I was not actually in imminent danger.

A few days later, I heard a commentator on the 9/11 commission say that complex systems are "like Swiss cheese" and that disasters happen when "a bunch of 'holes' line up."

This is very often true in dive accidents: It's not the first problem that leads to death; it's experiencing a second or third problem after ignoring or downplaying the first problem. While a complete loss of pressure and depth information is not something that can be ignored, I could have left my buddy to enjoy her dive or we could have navigated at least partially back underwater.

Either would almost certainly have been fine, but as the commentator put it, "Safety comes by making sure that the holes are as small as possible and by paying attention when they start lining up."

Contrast that model of failure with the way that computer systems fail. Rather than collapsing only in the face of multiple problems, computer systems work only when every detail is exactly as expected. At best, we can be happy that a programmer anticipated a particular abnormality: a missing file, the network not being visible, etc.

WINDOWS & .NET WATCH

LARRY O'BRIEN

Even when our software is smart enough to throw an exception and not just lock up, generally the only two options are a retry or an organized shutdown. There is no graceful degradation, no partial functionality, no knocking sound from under the hood to let us know something's about to go wrong: that my dive computer reported the water temperature as 42 degrees shortly before failing was a relatively rare indication that something was going awry with the system. (Monterey, Calif., is pretty cold, but 42 degrees is Vancouver-cold!)

Maybe this is a fundamentally intractable problem: Since getting the details right is a challenge for smart programmers, perhaps computer systems will necessarily remain fragile until we've achieved breakthroughs in artificial intelligence and are thereby far, far over the horizon from where we can see now.

Moving toward a world in which computer systems are not increasingly brittle is not just, or even primarily, a matter of following today's coding practices.

Microsoft's much vaunted code reviews are a good thing, certainly, but they don't fundamentally change the problem. While code reviews can close some holes, with today's computers you don't need to line up holes to get a failure—one problem and the system goes down.

IBM is undoubtedly the thought leader on this front, with what it calls "autonomic" or "self-healing" computers. Microsoft is beginning to make contributions to the field, with a paper by Microsoft Research's Yi-Min Wang et al. on the Strider project's recently winning an award at Usenix's LISA conference. (If you share my admiration for those who don't shirk from examples with 200,000-dimensional solution spaces, you can read the paper online at www.usenix.org/events/lisa03/tech/wang/wang_html/index.html).

Back at the shore, the cause of my dive computer failure became clear. It wasn't a bad battery, a programming defect, or the fact that I had failed to activate my software within 30 days of purchase. Droplets of water were clinging to the inside of the display. When they make electronics capable of operating while immersed in seawater, I'll consider relying on a computer-only console.

In the meantime, I'll be diving with analog gauges. ■

Larry O'Brien is an independent technology consultant and analyst, and the founding editor of Software Development Magazine.

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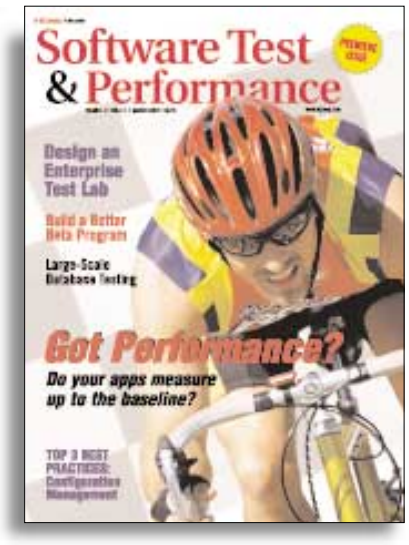
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LICENSED TO BILL

"Better late than never" isn't always true. In some cases, because you're late, the result could be "never again."

Microsoft customers who have been led down a primrose path with promises of "Yukon," "Whidbey" and "Longhorn," and whose software licenses with the company are due to expire, face a difficult decision. So do those businesses that might be considering a move to the Microsoft platform.

If you're already a Microsoft customer, do you lock into a new three-year license, knowing that delivery of these tools already has been pushed back once and that Microsoft is notorious for announcing products in one decade and delivering them in the next? On the other side, do you lock into a long-term deal with IBM or Oracle, taking the risk that soon the Microsoft database will be better—but you'll be unable to take advantage of it?

INDUSTRY WATCH

DAVID RUBINSTEIN

This all-or-nothing scenario is good neither for the vendors nor the customers. If you're the vendor, and a customer chooses to go in a different direction, you're left with nothing. If you're the customer and lock in to one company but really need to use the technology of another, you're forced to pay twice, or lose a potential competitive advantage by not making the software switch.

One solution, which customers are pushing upon large vendors with increasing frequency and vendors seem to be responding to, is pay-as-you-go licensing instead of long-term contracts. Companies don't want to pay for product licenses simply because the product is installed in their system someplace. Maybe they use it only once or twice a month. Why should they have to pay the same price as another company that might have that same software installed on 200 machines and uses it heavily every day?

By the same token, if the vendors don't become more flexible in how they license their software, they could wind up with nothing at all if companies decide they can live without that software once or twice a month, or find an alternative that costs less money.

"Large companies spend hundreds of millions of dollars per year on software," said Mark Horler, director of global consulting services for software licensing vendor Macrovision. "They said, 'We need to manage our assets and go beyond which software we've installed. We want to understand our usage versus the base we're paying to our vendors.' The infrastructure is now in place for them to do it on a quarterly, or monthly or even a weekly basis."

Flexible licensing helps both sides, according to Steve Dunton, chief technology officer at activAeon, which provides statistical analysis of enterprise application usage. The vendors will get more revenue from customers trying out more products than they might otherwise, and the customers pay only for what they use. "It creates an honest situation in licensing," he said.

Dunton noted that keeping track of Microsoft licenses, especially under its Service Providers License Agreement program, is very complex, despite the company's multiple revisions to the program since its inception in 2000. "It's like filling out a tax return," Dunton commented, noting that the program requires service providers to report such things as terminal server usage and the number of users logged into a system so they can report their activity to Microsoft for proper billing.

ISVs, he added, traditionally charge on a per-user or per-concurrency basis. But software is being created that now allows them to charge the end user per hour for a hosted solution, or to create other models that better suit the needs of the customer. Getting a better handle on software licenses helps companies better manage their software assets, and gives them greater flexibility.

"Most corporate environments have 2,000 PCs, and some might sit in a reception area and never be used, but because software is installed on it, it'll cost that company," Dunton said.

Macrovision is working with Motorola to create a certification program. "It's designed to give end users confidence that the software licenses are easy to manage and report on, and in the event of something going wrong from a licensing perspective, such as a license expiring or a server going down, the application will behave in a predictable manner that's customer-friendly," Horler said.

Motorola, for example, keeps its license servers in a warehouse in Tempe, Ariz., but they can be accessed by an end user in, say, Malaysia. This will raise issues of taxation and import or export tariffs as governments and vendors try to determine the value of the license if it's used on a global basis.

It would seem the large software customers are in the driver's seat here. Vendors naturally fear a big drop-off in revenue if they can't charge for their software under the old model, but it's inevitable. If one vendor is willing to offer a product that provides greater visibility into usage patterns than another, soon they all will have to. And so long as Macrovision isn't trying to mandate a business model for software vendors, but is creating a certification program that gives flexibility to the vendors, it should be embraced. ▮

David Rubinstein is editor of SD Times.

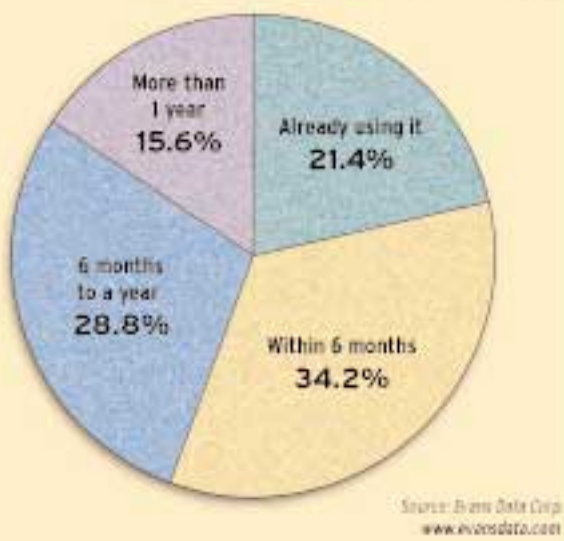
When Will Linux Users Migrate to Kernel 2.6?

DATA WATCH

Linux kernel 2.6 was declared stable by Linus Torvalds in December 2003, yet only about one in five developers has adopted the latest version, according to the Linux Development Survey 2004, published in March by Evans Data Corp.

Planning to take advantage of the vastly increased user and process ID capacities of kernel 2.6 were more than 60 percent of the survey's respondents, who said they would upgrade within a year. About 15 percent said they would upgrade more than one year from now.

Other reasons to upgrade include enhancements to threading capabilities and support for 64-way processing on 32-bit hardware. To upgrade, developers can either download kernel 2.6 from sites such as www.kernel.org and compile the kernel on their systems, or simply wait for their Linux vendor to make the change and upgrade to the new distribution.



BUSINESS BRIEFS

Sybase Inc. has signed an agreement to buy **XcelleNet Inc.** for about US$95 million in cash, the company has announced. XcelleNet, which makes device management software, will be integrated into Sybase's **iAnywhere Solutions** subsidiary, Sybase CEO John Chen said in a statement . . . **IBM Corp.** announced it will acquire longtime partner, systems management and performance software vendor **Candle Corp.** Terms of the deal were not disclosed. The acquisition advances IBM's vision of On Demand computing and will help the company deliver to its customers a way to keep their mainframes and databases in sync with rapidly changing business requirements, IBM said in a statement . . . **Lindows Inc.** has renamed its LindowsOS desktop Linux operating system Linspire, and its Web site has been renamed www.linspire.com, in an effort to counter **Microsoft Corp.**'s strategy to sue the company over what Redmond claims is an infringement of its "Windows" trademark. While the San Diego-based Lindows won a victory in Europe in early April when courts in France denied Microsoft an injunction, the 2-year-old battle in the U.S. continues, with Microsoft's appeal pending in the Ninth District Circuit Court of Appeals . . . Stronger than expected sales of the iPod digital music player helped **Apple Computer Inc.** more than triple its net profit for the second fiscal quarter ended March 27 when compared with year-ago figures. Apple reported sales of 807,000 iPods during the quarter, which it says represent a 909 percent increase over the same quarter last year. Apple's profit was US$46 million, or 12 cents per diluted share, as compared with last year's second-quarter profit of $14 million, or 4 cents per diluted share. Second-quarter revenue was $1.9 billion, an increase of 29 percent from the same quarter a year ago, the company reported. ▮

CALENDAR OF EVENTS

IDUG 2004 May 9–13
Orlando, Fla.
INTERNATIONAL DB2 USERS GROUP
conferences.idug.org/namerica/2004

Gartner Application Integration & Web Services Summit May 17–19
Los Angeles
GARTNER INC.
www4.gartner.com/2_events/conferences/apn12.jsp

Microsoft Tech-Ed May 23–28
San Diego
MICROSOFT CORP.
www.microsoft.com/seminar/teched2004

BEA eWorld May 24–27
San Francisco
BEA SYSTEMS INC.
www.bea.com/eworld

Enterprise Architecture Summit June 6–8
Rancho Mirage, Calif.
FAWCETTE TECHNICAL PUBLICATIONS INC.
www.ftponline.com/conferences/eas

For a more complete calendar of U.S. software development events, see www.bzmedia.com/calendar.

Information is subject to change. Send news about upcoming events to events@bzmedia.com.

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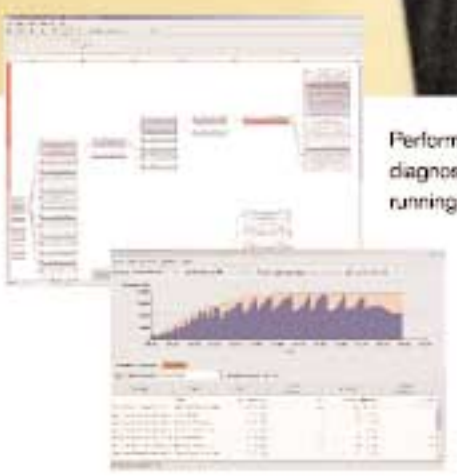

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